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15 FEB 1967
NATURAL HISTORY

PROCEEDINGS

OF THE

Bournemouth Natural Science Society

VOL. LVI

SESSION 1965-66

Price . Five Shillings

15 FEB 1967
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VOL. LVI

SESSION 1965-66

PUBLISHED BY THE SOCIETY AT ITS HOUSE,
39 CHRISTCHURCH ROAD, BOURNEMOUTH, 1967

Contents

	Page
Introductory Note	3
Officers and Council, 1966-67	4
Committees, 1966-67	5
List of Members (2nd January, 1967)	6
Summary of Accounts for Year ending 30th September, 1966 ...	14
Council's Report for Year ending 30th September, 1966	18
Affiliations and Publications received	20
Obituary Notices:—	
Joseph Henry Bailey	22
Thomas Harold Bickel	22
William Saye Ilston Cox	23
Section Reports for the Year 1965-66:—	
Library	23
Museum	24
Slides Collection	25
Garden	25
Archaeology and History	26
Astronomy	27
Botany	28
Geography	29
Geology	31
Photography	32
Physics and Chemistry	32
Zoology	
Entomology	33
Ornithology	35
Ciné Film Subscription Programmes	36
Presidential Address for the Year:—	
The Mountains of East Africa and their Vegetation by Mrs. A. K. Hunt, B.Sc.	37
List of Presidents—1903-1967	47

Introductory Note

The objects of the Society are declared in the second of its Rules to be "the promotion of the study of Science in all its branches, and of Public Education, by means of Lectures, Field Meetings, the reading and discussion of Papers, and in any way that the Council of the Society shall deem advisable".

The branches of Science at present represented are as follows:— **Archaeology and History, Astronomy, Botany, Geography, Geology, Microscopy, Photography, Physics and Chemistry, Zoology — Entomology and Ornithology.**

During the Winter Session, from October to April, lectures on matters of scientific interest are held on two or three days a week. These are usually illustrated by slides, films, episcope pictures, specimens, diagrams, experiments, etc.

Throughout the Summer Session, from April to September, Excursions or Field Meetings are arranged on two or three days every week, when parties of members visit places of scientific interest under the guidance of section chairmen and other specialists, sometimes in or near Bournemouth, at other times farther afield by coach or train.

The Society possesses a Library from which books may be borrowed by members, and there is a Reading Room where works of reference may be consulted. The Museum contains many valuable scientific collections and specimens. The Library and the Museum serve to illustrate and illuminate the ten Sections of the Society. There is a well-equipped Dark Room for the use of members interested in photography. The house stands in a pleasant garden of over an acre.

The management of the Society is vested in a Council, which is elected at the Annual General Meeting. Members are elected by the Council. An Entrance Fee of 5/- is payable upon nomination for election. The Annual Subscription for Town Members is £2 (Life Membership: £15); for Associate Members, aged 12-18 years, it is 10/-. The Family Subscription (for members of a family living in the same house) is as follows:— first adult member, £2; second adult member, 30/-; each additional adult member, 20/-; children between 12 and 18 years (Associate Members), 5/- each. **Town Membership is confined to those who are resident within the Municipal, Urban District and Parish Boundaries listed below:—**

HAMPSHIRE: Bournemouth County Borough, Hurn, Sopley, Christchurch Municipal Borough, Christchurch East.

DORSET: Poole Municipal Borough, Wimborne Urban District, Hampreston, West Moors, West Parley.

Members, other than Associate Members, living outside the areas listed above, shall pay half the above rates of subscription. (Life Membership £15.)

A bi-monthly Programme giving full details of all meetings is posted to every member. A Volume of Proceedings is published annually; adult members receive a copy.

Application Forms for Membership and further particulars may be obtained from the Honorary Assistant Secretary, Miss M. Hipperson, B.N.S.S., 39 Christchurch Road.

Bournemouth Natural Science Society

OFFICERS AND COUNCIL FOR 1966-67

N.B.—University degrees and other qualifications are inserted only at the first mention of names.

President

MRS. A. K. HUNT, B.SC.

Vice-Presidents

A. J. BUTCHER, F.R.I.B.A.
E. CHAMBERS, F.L.S.
H. E. CLARKE, M.A., B.SC., F.R.I.C.
MISS F. M. EXTON, B.A.
MISS D. M. LOWTHER, B.SC.
MISS M. A. M. PENROSE, B.SC.
W. J. READ, M.SC., F.R.I.C.
MRS. W. BOYD WATT, F.Z.S., M.B.O.U.
W. P. WINTER, B.SC.
D. A. WRAY, PH.D., M.SC., F.G.S.

Chairman of Council

F. W. MOSS

Council

(*ex-officio*): THE VICE-PRESIDENTS, OFFICERS AND CHAIRMEN OF SECTIONS

T. M. BELL, B.A., M.B., B.Ch.
H. C. BLACKMORE, L.D.S., R.C.S.
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MRS. V. W. EATON
BRIG. A. B. D. EDWARDS, C.B.E., M.C.
W. E. PAGE, M.A.
W. F. PERRY, B.SC.
P. J. PIPER, F.R.I.C.S.
G. A. SHILLIDY, C.I.E.
MISS E. M. WHITAKER
MRS. M. P. YULE
A. E. WITHERS, F.A.I.

Chairmen of Sections

Archaeology and History: MRS. C. SIMPSON
Astronomy: C. M. PITHER, F.R.A.S., F.I.L.S.
Botany: MRS. A. K. HUNT, B.SC.
Geography: MISS F. M. EXTON, B.A. (*Chairman*)
Geology: D. A. WRAY, PH.D., M.SC., F.G.S.
Microscopy:
Photography: MISS U. M. OGLE
Physics and Chemistry: MRS. I. M. BIRCUMSHAW, B.SC.
Zoology:
Entomology: K. G. GOODYEAR, F.R.E.S.
Ornithology: H. V. HARRIS

Hon. Treasurer: F. J. WOOD

Hon. Assistant Treasurer: A. E. WITHERS

Hon. Secretary: F. C. FILDES

Hon. Assistant Secretary: MISS M. HIPPERSON

Hon. Programme Secretary: A. CHARTER

Hon. Press Secretary: MISS C. M. BRAIN

Hon. Librarian: H. S. HOLBROOK, B.SC., C.Eng., F.I.E.E.

Hon. Curator: MRS. N. SEPHTON, M.B., Ch.B.

Hon. Editor: D. T. ADAMS, M.A.

Hon. Slides Custodian: J. C. MITTON

Hon. Projectionists: *Ciné*—D. J. DUDLEY; *Still*—G. HOLROYD

Hon. Auditors

A. V. LAWES AND A. H. MIDDLEMAST

Hon. Architect
A. J. BUTCHER, F.R.I.B.A.

Hon. Solicitors
HAROLD G. WALKER & CO.

Bankers

NATIONAL PROVINCIAL BANK LTD., THE SQUARE, BOURNEMOUTH

COMMITTEES, 1966-67

Finance and General Purposes

Chairman: F. W. Moss

President, Hon. Treasurer, Hon. Secretary, Chairman of Chairmen of Sections Committee (*ex-officio*),

A. J. Butcher, M. H. Cocke, A. B. D. Edwards, H. V. Harris

Miss M. Hipperson, Miss D. M. Lowther, A. E. Withers

Library

Chairman: M. H. Cocke

D. T. Adams, H. E. Clarke, H. S. Holbrook, Mrs. A. W. White

Museum

Chairman: Mrs. N. Sephton

Chairmen of Sections (*ex-officio*)

Garden

Chairman: Mrs. W. Chome

Mrs. A. K. Hunt, Miss E. M. Whitaker

House

Chairman: A. J. Butcher

F. C. Fildes, Mrs. M. E. Lever, Miss D. M. Lowther

Tea

Chairman: Miss E. M. Whitaker

Miss Burroughs, Mrs. Kenworthy, Mrs. Le Sueur, Mrs. Logie, Mrs. Powis, Miss Rowe, Miss Saunders, Mrs. Taylor, Miss White, Mrs. Wycherley

Entertainment

Chairman: Miss M. Allen

Mrs. E. M. Fildes, Mrs. C. D. M. Goldie, F. W. Moss

Bournemouth Natural Science Society

List of Members

Revised to 2nd January, 1967

*Honorary Member — wGilbert White Fellowship
vVice-President — lLife Member
†Past President — oOriginal Member
aAssociate Member

The year of election is given before the name of each member

1961	Adams, D. T., M.A.	13 Sandy Mead Road, Queen's Park
1961	Adams, Mrs. M.	" "
1961	Aiers, Miss E. M.	Flat 2, Earlston, 8 Portarlington Road
1958	Agar, R., A.M.I.C.E.	84 Howard Road
1958	Aiers, Mrs. F.	6 Arnewood Court, West Cliff Road
1962	Allen, Mrs. A. W. S.	80 Bath Hill Court
1958	Allen, Mrs. F. C.	8 Twynham Road, Southbourne
1963	Allen, Miss M.	174 Holdenhurst Road
1960	Alsford, C.	Long Field, Church Road, Ferndown
1960	Alsford, Mrs. J. R.	" "
1956	Ambler, Lieut. Col. M. J.	Min's Cottage, 5a Branksome Wood Road
1955	Ambler, Mrs. A.	" "
1965	Andrews, Miss K. E.	14 Frances Road
1963	Archer, Mrs. H. M.	4 Barclay Mansions, St. Valerie Road
1967	Argent, J. P.	9 Crab Close, S. Canford Heath, Poole
1965	Ash, Miss C. C.	135 Capstone Road
1950	*Bailey, Mrs. A. A.	30 Talbot Road
1955	Bailey, Miss F. E. L.	39 Strouden Avenue
1955	Bailey, Miss G. L.	57 St. Catherine's Road, Southbourne
1964	Balch, Miss M. M., M.B.E., B.A	Flat 3, 37 Queen's Park South Drive
1962	Balfour-Browne, Miss E. F.	Acorn Cottage, Station Road, Verwood
1957	Baly, Miss O. M.	70 Brackendale Road
1966	Band, J., M.P.S.	5 Boscombe Cliff Road
1966	Band, Mrs. M., M.A.	"
1966	aBand, Miss E. M.	"
1967	Banks J. L. C.	Kingston, Dene Walk, Ferndown
1965	aBates, A. D.	8 Southlea Avenue, Southbourne
1966	Bates, Mrs. G. E.	29 Lascelles Road
1944	Bell, T. M., B.A., M.B., B.Ch.	5a Stourwood Avenue, Southbourne
1941	Bell, Mrs. R. M.	" "
1966	Bennett, Mrs. J. K. M.	Flat 21, Eagle Hurst, Eagle Road, Branksome, Poole
1963	Bennetts, Miss K. M.	57 Harland Road, Southbourne
1947	Berrill, Miss M. E.	41a Cavendish Road
1965	Best, A.	"Broadview", Southbourne Coast Road
1967	Bettell, Miss I. M.	4 Curzon Court, Portarlington Road
1966	Bidder, E. R.	Bourne Hall Hotel, Westbourne
1965	Bircumshaw, Mrs. I. M., B.Sc.	Flat 116, Albany, Manor Road
1946	Blackmore, H. C., L.D.S., R.C.S.	17 Ferry Road, Southbourne
1946	Blackmore, Mrs. E. E.	" "
1966	Blanksby, Mrs. A. M.	3 Stirling Court, Manor Road
1964	Blower, Miss M.	105 Ringwood Road, Verwood
1960	Boite, E. E. G.	17 Browning Avenue, Boscombe Manor
1966	Booth, Miss J. M.	41 Cedar Avenue, Christchurch
1957	Booth, Mrs. L.	" "
1965	aBorowski, M.	30 Ashley Road, Parkstone
1966	Boston, Miss S. S.	69 Wimborne Road
1956	Boulton, Miss E. L.	2a Stour Road, Queen's Park
1964	Brady, J. R.	Compton Acres, Canford Cliffs

1956	Brain, Miss C. M.	16 Knole Road
1964	Brewer, Mrs. R. L.	39 Hengistbury Road
1966	Broughton, R. E.	33 Newstead Road, Southbourne
1966	Brown, Miss R. W., B.A.	11 St. Winifred's Court, 3 St. Winifred's Road
1962	Brown, Miss V. C.	8 Park Road
1951	wBull, A. W. M., C.B.	Broom House, Chiltern Road, Hitchin
1964	Burroughs, Miss I. K.	14 Richmond Park Avenue
1966	Burrows, Miss E.	Cottonwood, Grove Road
1930	Bury, Miss G. J.	4 Berne Court, Grove Road
1946	Busby, Miss A. G.	Flat 4, 77 Haven Road, Canford Cliffs
1952	†vButcher, A. J., F.R.I.B.A.	"Hilton", Dudsbury Avenue, Ferndown
1957	Butler, G. W.	Old Park Farm, Lytchett Matravers
1957	Butler, Mrs.	" "
1928	LCalkin, J. B., M.A., F.S.A.	Virginia House, Langton Matravers
1964	Cartwright, Miss D. E., M.B.E.	31 Wistaria House, Redhill Drive
1965	Casstles, Miss P.	2 Arishmel, 1 Powell Road, Parkstone
1943	†vChambers, E., F.L.S.	3 Gainslea Court, Derby Road
1950	Chambers, Mrs. E.	" "
1959	Charter, A.	Flat 3, 1 Cavendish Place
1959	Charter, Mrs. E. E.	" "
1965	Chick, W. L.	28 Albion Road, Christchurch
1945	Child, Miss L. M.	31a Southbourne Road
1912	L*Chilver, Miss K. M.	c/o 23 Wimborne Road
1951	Chomé, E. E. P.	6 Alyth Road
1942	Chomé, Mrs. W.	"
1950	Churches, Mrs. E. W., M.B., Ch.B.	The White House, Colebrook Street, Winchester
1962	Clark, Mrs. F. M.	12 Alum Chine Road
1958	Clarke, Miss A. M., B.A.	54 Charminster Avenue
1945	†vClarke, H. E., M.A., B.SC., F.R.I.C.	4 Gardens Court, Parkstone Road, Poole
1945	Clarke, Mrs. M.	" "
1927	*Clay, R. C. C., M.D., F.S.A.	The Manor House, Fovant, Wilts
1966	Clements, Mrs. C. M. E.	Top Flat, 1 Westbourne Park Road
1963	Clode, J. C.	11 Oakley Road, Wimborne
1966	Coates, J. E.	21 Woodside Road, Ferndown
1966	Coates, Mrs. D. M.	" "
1958	Cocke, M. H.	18a Penn Hill Avenue, Parkstone
1961	Coe, Mrs. G.	26b Cavendish Road
1966	Colmer, Mrs. M.	s/a Milton Lodge, 32 Milton Road
1941	LCooper, Mrs. E. M.	125 Queen's Park Avenue
1951	LCooper, Miss R. I.	" "
1945	Cooper-Hunt, Mrs. E. G.	40 Marine Drive East, Barton-on-Sea
1965	Cornell, Mrs. N. J.	1 Marybourne, 4 Manor Road
1952	Corser, Miss G. M.	3 Aspen House, Elm Grove Place, Salisbury, Wilts.
1948	Cox, Mrs. E. D.	248 Castle Lane
1956	Cox, Miss M. G. E.	7 Chessington Ct., Durley Chine Road
1962	Cragg, Miss M. A.	Bourne Hall Hotel, Westbourne
1962	Critchley, Mrs. M. M.	2a New Street, Ringwood, Hants.
1966	Cromey-Hawke, Mrs. D.	38 Elgin Road, Talbot Woods
1965	Curry, Miss S.	20 Stourwood Road, Southbourne
1903	*oCurtis, W. Parkinson, F.R.E.S. F.Z.S.	2 The Close, Westminster Road, Branksome Park
1959	Cuthbertson, Miss R. E.	179a Richmond Park Road
1959	Cutland, W.	Flat 11, Guy's Close, Addison Square, Ringwood, Hants.
1959	Cutland, Mrs. H. M.	" "
1960	Dalrymple-Watt, Lady G. V.	1 Berwick Road, Talbot Woods
1965	aDando, M. S.	22 Ravine Road, Boscombe
1959	Danne, Miss E. M. M.	Flat 5, 12a Branksome Wood Road
1966	Davis, Miss H. I., M.A.	11 St. Winifred's Court, St. Winifred's Road

1964	Davis, Mrs. M. M.	70 Seafield Road, Southbourne
1964	Day, Mrs. A.	15 Bosley Way, Christchurch
1952	Day, Mrs. E. I.	16 Coryton Close, Dawlish, Devon
1957	Dear, Miss D.	23 Burnham Drive
1966	Decalmer, P. B. S.	21b Meyrick Park Crescent
1930	*de Castro, H.	72 Springdale Avenue, Broadstone
1962	Dennis, Miss R. S., S.R.N.	32 Crabton Close Road
1935	Derry, Mrs. H. E.	33 Belle Vue Crescent, Southbourne
1962	Dickson, A. A.	"Muskerry", 23 Sandy Lane, Upton
1961	Dixon, Sir Arthur, C.B., C.B.E., B.A.	Bourne Hall Hotel, Westbourne
1949	Dixon, Miss H. C.	Meyrick Grange Hotel, 50 Christchurch Road
1958	Domney, Miss M.	Flat 2, 77 Haven Road, Canford Cliffs
1960	Dool, Mrs. N. M.	55 East Howe Lane
1964	Downe, Mrs. F. E.	67 Portchester Road
1966	Draper, A. C.	68 St. Alban's Avenue
1961	Draper, Mrs. G.	" "
1953	Dudley, D. J.	17 Widdicombe Avenue, Parkstone
1955	Dudley, Mrs. I.	"
1953	Eaton, Mrs. V. W.	12a Alum Chine Road, Westbourne
1956	Edmonds, Miss K. E.	74 Namu Road, Winton
1965	Edwards, Brig. A. B. D., C.B.E., M.C.	234 Burlington Hotel, Boscombe
1966	Elcock, Miss S. F.	62 Danesbury Avenue, Southbourne
1963	Elliott, Mrs. D.	85 South Road, Boscombe
1955	†vExton, Miss F. M., B.A.	39 Branksome Wood Road
1960	Exton, Miss J. M.	" "
1959	Falvury, P.	Alpine, Warren Road, Westbourne
1953	LFarwell, Mrs. S. M. A.	Latch Farm, Fairmile, Christchurch
1966	Faulkner, J. W. T.	Bourne Hall Hotel, Westbourne
1956	Fergusson, Mrs. C. A. M.	137 Overcliff Drive, Southbourne
1963	Field, A. J., M.C., B.Sc., F.I.M.	85 Lower Blandford Road, Broadstone
1963	Field, Mrs. E., B.Sc.	" "
1965	Fildes, F. C.	32 Clifton Road, Parkstone
1965	Fildes, Mrs. E. M.	" "
1966	Fitch, Miss E. N.	Little Mead, Maxwell Road, Canford Cliffs
1965	Foley, Miss E.	27 Headswell Avenue, Redhill Heights
1954	Follett, Mrs. V.	Windward, Stevenson Crescent, Parkstone
1962	Foote, H. N., D.Opt.	Park Walk, Shaftesbury, Dorset
1966	Fornells, Miss M.	84 Leeson Road, Queen's Park
1966	Foster, Mrs. A.	33 Tollard Court, West Hill Road
1963	Fox, Mrs. V.	17 Shaftesbury Road
1963	Freeman, Miss R. C.	10 St. Augustin's Road
1960	Gahan, Mrs. M.	215 Holdenhurst Road
1957	Galbraith, Mrs. A.	5 Lyndwood Court, Drysgot Road, Radyn, nr. Cardiff
1956	Gandy, Mrs. L.	11 Cranleigh Gardens, Southbourne
1955	Gardiner, P. C., F.R.I.C., C.Eng., M.I.Chem.E., M.Inst.Gas.E.	61 Ophir Road
1951	Goddard, Miss E. F.	215 Holdenhurst Road
1963	Goldie, Mrs. C. D. M.	20 Balcombe Road, Branksome Park
1959	Gompel, M. E., B.Sc.	12 Chigwell Road
1937	Gompel, Mrs. M. K.	"
1960	Good, Prof. R., M.A., Sc.D.	8 Durlston Road, Parkstone
1960	Good, Mrs. P. G.	" "
1949	Goodhart, Mrs. M. S.	West Thorpe, Lymington
1956	Goodman, Miss J. R.	6 Pinewood Road, Branksome Park
1965	Goodyear, K. G., F.R.E.S.	26 Twynham Avenue, Christchurch
1963	Goulton, Mrs. V. O. A. A.	Flat 2, 39 Branksome Wood Road
1963	Graham, Miss C.	1 Horsa Close, Horsa Road
1965	Grange-Bennett, Mrs. M.	6 Brudenell Avenue, Poole

1960	Grattan, Miss L. T.	Solent Cliffs Hotel, West Cliff
1953	Gray, Miss E.	44 Edmondsham House, Terrace Road
1956	Green, Miss G. M., B.A., L.ès.L.	17 Clifton Road, Parkstone
1967	Griffiths, H. D.	23 Penrith Road, Boscombe
1965	aGunn, J. P. N.	"Broomhill", Frogham, Fordingbridge
1956	Habershon, Miss E. M.	Leas Court, Cliff Drive, Canford Cliffs
1961	Haines, Miss E. S.	"Little Orchard", Godshill, Fordingbridge, Hants
1951	Haines, Miss G. M.	Appleslade, Linwood, Ringwood
1951	Haines, Miss R. M.	" "
1962	Hall, Mrs. E., B.Sc.	16 Beresford Road, West Southbourne
1965	Hall, I. G.	"Southmead Cottage", Burley Lodge, Burley, Ringwood
1965	Hamilton, R. M. S., M.A.	"Green Acres", Tom's Field, Langton Matravers
1953	Hancock, Mrs. C. E.	912 Castle Lane East, Iford
1959	Hannam, B., M.P.S.	16 Hazelwood Avenue, New Milton
1955	Hannam, Mrs. W.	" "
1959	Hards, Mrs. D. K.	30 Dean Park Road
1960	Hardy, Miss L. H.	20 The Grove, Redhill Park
1955	vHarris, H. V.	15 St. Winifred's Court, St. Winifred's Rd.
1958	Harris, Mrs. W. I.	" "
1965	aHarrison, Miss J.	45 Beaufort Road, Southbourne
1958	Hart, Miss C. L., S.R.N.	The Thatched Cottage East, Godwin's Croft, Bransgore, Hants
1961	Harvey, Mrs. F. E., M.B., Ch.B.	C21, San Remo Towers, Boscombe
1959	Harvey, Miss G. E. J.	37 Redhill Court, Wimborne Road, Moordown
1964	Hatton, R. H. S., M.A.	The Small House, Llangennith, Glam.
1951	Hawker, Mrs. E.	64 Alumhurst Road
1951	Hayman, Miss M. S.	39 Queen's Park South Drive
1956	Heath, Mrs. C. J.	Keverstone Court Hotel, Manor Road
1966	Hemsley, R. F.	20 Stourcliffe Avenue, Southbourne
1966	Hemsley, Mrs. V. E.	" "
1954	Hermon, J. A.	43 Stourcliffe Avenue, Southbourne
1965	Hind, A. E.	68 Guest Road, Branksome, Poole
1956	Hinton, Miss E. M.	1 Lonsdale Road
1962	Hipperson, Miss M.	69 Headswell Avenue
1965	Hoare, Mrs. L. E.	4 Harewood Avenue, Boscombe East
1966	Hoare, M. J.	113 Moffats Lane, Brookman's Park, Herts.
1962	Hodson, Prof. F., Ph.D., F.G.S.	Geology Dept., University of Southampton
1960	Holbrook, H. S., B.Sc., C.Eng., F.I.E.E.	5 Staunton House, Exeter Park Road
1963	Holbrook, Mrs. M. E.	" " "
1962	Holmes, Mrs. N. E. F.	7 St. John's Road, Boscombe
1952	Holroyd, G.	4 Beechey Road
1965	Holroyd, P. H.	1 Watcombe, Highland Road, Colehill, Wimborne
1965	Holt, E. H.	36 Lindsay Road, Poole
1961	Hooton-Smith, E. W.	36 Wellington Road
1961	Hooton-Smith, Mrs. B. E.	"
1967	Hopkins, Miss C. M.	St. Hugh's College, Oxford
1957	Hunt, W. H.	Flat 1, 5 Alton Road, Parkstone
1954	Hunt, Mrs. A. K., B.Sc.	" "
1952	Imlach, Mrs. M. G., B.A.	2 Redcotts, Wimborne, Dorset
1959	Jackson, Miss M.	1360 Christchurch Road
1933	James, Mrs. M. G.	70 St. Alban's Avenue
1960	James, W. H.	19 Donnelly Road, Southbourne
1945	Jenkins, Miss P.	Galltfaenan, Trefnant, Denbigh
1966	Jepps, Miss M. A.	2/13 Ascham Road

1964	Johnson, Miss W. L.	15 Herbert Road, Westbourne
1962	Jones, Miss O. E. C., S.R.N.	86 Hoburne Farm Park, Christchurch
1928	Kendall, Miss G. J., A.R.C.M.	20 Serpentine Road, Poole
1963	Kenworthy, Mrs. J. S. G.	8 Ripon Road, Winton
1965	Kilby, Miss M.	15 Southlands Avenue, Corfe Mullen
1965	Killick, Mrs. K. D.	4 Highlands Road, Barton-on-Sea
1944	Kirke, Miss M.	3 Fairthorne Court, 27a Bodorgan Road
1965	Lamb, Miss J. P., S.R.N.	121 Sheringham Road, Branksome
1964	Lambert, F. H., A.R.I.B.A.	50 Hillside Drive, Christchurch
1964	Lambert, Mrs. D. M.	" "
1965	Lambert, Mrs. V. L.	School House, School Lane, Ringwood
1959	Lawes, A. V.	48 Seafield Road, Southbourne
1962	Leake, Mrs. I. B.	21 Langside Avenue, Parkstone
1966	Leck, Miss W. A.	5 Heathwood Road
1966	Lee, W. H.	18 Ravenshall, West Cliff Road
1958	Leeland, Mrs. F.	34 Noel Road, Wallisdown
1966	Legge, Mrs. I.	E13, San Remo Towers, Sea Road, Boscombe
1948	Leonard, Mrs. N.	1 Neville Court, Derby Road
1957	Le Roy, Miss E. S. H.	Forest Mead, Tyrell's Ride, Burley, Hants
1957	Le Roy, Miss M. C. G.	" "
1958	Le Sueur, Mrs. D. G.	49 Wellington Road
1965	Lever, Mrs. M. E.	39 Christchurch Road
1961	Lewis, Miss D. M.	137 Burlington Hotel, Boscombe
1966	Lewis, D. N.	12 Heather Bank, Haywards Heath, at Dept. of Paleontology, Brit. Museum, S.W.7
1966	Lewis, Miss S.	31 Greenways, Highcliffe-on-Sea
1951	Lloyd, G. B., B.A.	58 Glenferness Avenue
1950	Locke, G. S.	85 Seafield Road, Southbourne
1950	Locke, Mrs. J. B. E., B.A.	" "
1947	Logan, Miss A.	3 Grosvenor Court, Vale Road
1952	Logie, Mrs. G.	Flat 1, "Pendennis", Derby Road
1957	Lovell, Mrs. L.	36 Merley Way, Wimborne
1951	wLowe, Mrs. D. M.	43 Marryat Road, Wimbledon, S.W.19
1934	†vLowther, Miss D. M., B.Sc.	Lonsdale, 15 Mayfield Avenue, Parkstone
1967	Ludgate, H. C.	12 Lakeside Road, Branksome Park
1966	McClay, H.	64 Blake Dene Road, Lilliput
1965	MacDonald, C. M.	15 Dingle Road, Southbourne
1963	MacKeith, Miss M. R., B.Sc.	13 Addis Square, Southampton
1953	McKeown, Miss K. E.	15 Ravine Road, Southbourne
1956	Maddox, Mrs. L. M.	31 Egerton Road, Queen's Park
1959	Mariette, Miss G. A.	4 Mansfield Avenue, Parkstone
1946	Marshall, Miss D. H.	76 Palace View, Bromley, Kent
1954	Marshallsay, Miss E. N.	Derby Hall Hotel, 24 Knyveton Road
1965	Martyn, Mrs. D. M.	15 Waverley Road
1964	Masters, Miss K. F.	10 West Way Close, West Way
1958	Mate, Mrs. F. M.	8 Clifton Road, Parkstone, Poole
1966	Mate, Miss M. R. G.	D15, Pine Grange, Bath Road
1960	Maxted, Mrs. G. E.	2a Wilfred Road, Boscombe
1956	Middlemast, A. H.	86 Hengistbury Road, Southbourne
1956	Middlemast, Mrs. M.	" "
1964	Middleton, W. J.	34 Compton Avenue, Parkstone
1965	Miles, L. L. H.	D41 San Remo Towers, Sea Road, Boscombe
1964	Miller, A. C.	2 Woodland Ct., Branksome Wood Road
1964	Miller, Mrs. W. R.	" "
1966	Millington, Mrs. C. S.	27 Ravenshall, West Cliff Road
1956	Mills, Miss N.	8 Herbert Road
1962	Milne-Day, D. L.	Halnaker, Barnes Lane, Milford-on-Sea
1959	Mitton, J. C.	3 Gainsborough Road
1957	Moore, W.	139 Alder Road, Parkstone

1962	Moore, Mrs. J.	139 Alder Road, Parkstone
1965	Morgan, A. E.	c/o Flat 1, 4 Manor Road
1959	Morgan, Commander S. T., O.B.E., R.N. (Retd.)	Bracken Cottage, Blissford, Fordingbridge, Hants
1959	Morgan, Mrs. V.	" "
1964	Morton, Miss E. M. W.	21 Pinebeach Court, Canford Cliffs
1963	Moss, F. W.	39 Hengistbury Road, Southbourne
1963	Moss, Mrs. D. M.	" "
1962	Mott, Miss J. H.	2 Warren Avenue, Mudeford, Hants.
1966	Munns, Miss N. W., B.Sc.	28 Crescent Court, Chine Crescent
1965	Murch, Mrs. O. E.	4 Highlands Road, Barton-on-Sea
1960	Nelson, A., F.C.A.	65 Alyth Road, Talbot Woods
1965	Newton, Miss J.	Bourne Dene Hotel, Manor Road
1963	Newton, Mrs. K. F.	Rose Hill Hotel, MacAndrew Road, Canford Cliffs
1962	Odell, F. H. B.	Cottonwood Hotel, East Cliff
1957	Odell, Mrs. G. B.	" "
1956	Odlum, Miss D., M.A., M.R.C.S., L.R.C.P., D.P.H.	11 Cliff Drive, Canford Cliffs
1964	Odom, Miss E. V., M.A.	18 Church Road, Southbourne
1929	Ogden, Miss E.	1 Rossini Cottage, Hedgemead, Bath
1948	Ogden, F.	Cottonwood Hotel, East Overcliff Drive
1950	Ogle, Miss U. M.	2 Frankland Crescent, Parkstone
1965	Oliver, Miss D. K.	35 Boscombe Spa Road
1960	Ollier, G.	202 Harewood Avenue, Queen's Park
1960	Ollier, Mrs. B.	" "
1959	Oppé, E. F.	"Peakey", Worth Matravers, Swanage
1948	Osborne, Mrs. B. E.	B6, San Remo Towers, Boscombe
1966	O'Shea, Miss S. T.	14 Undercliff Drive, Boscombe
1958	Page, W. E., M.A.	53 Petersfield Road, Boscombe East
1945	Paris, Lt.-Col. A., R.E. (Retd.)	11 Stourwood Road, Southbourne
1956	Paris, Mrs. G.	" "
1965	Parker, P. L.	161 Redhill Drive
1965	Parker, Mrs. D. H.	"
1965	Parker, R. N.	"
1963	Payne, Miss H. I.	83 St. Luke's Road
1916	*LPenrose, Miss F.	Little Picket, Hightown, Ringwood
1916	*LV†Penrose, Miss M., B.Sc.	" "
1948	Perceval, Mrs. W.	7 Benellen Avenue
1960	Perry, C. C.	15 Seafield Road, Southbourne
1963	Perry, W. F., B.Sc.	117 Portland Road
1961	Pesterfield, Miss M.	56 Gresham Road
1950	†Peters, Sir R. A., M.C., M.A., M.D., F.R.S.	3 Newnham Walk, Cambridge
1953	Pickering, V. T.	Francesca, Hightown, Ringwood, Hants
1953	Pickering, Mrs. C. G.	" "
1959	Pierce, Mrs. E. K.	4 Mansfield Avenue, Parkstone
1959	Piper, P. J., F.R.I.C.S.	18 Mayfair, West Cliff Road
1959	Piper, Mrs. M. G.	" "
1966	Pither, C. M., F.R.A.S., F.I.L.S.	86 Canberra Road, Christchurch
1966	Poole, Mrs. I.	23 Spur Hill Avenue, Parkstone
1955	Porter, Miss D. A.	23 Christchurch Road
1957	Powis, Mrs. M. E.	37 Wheaton Road, Pokesdown
1965	Preston, Mrs. T. A.	11 Nairn Court, 12 Nairn Road
1964	Prince, Miss E. M.	4 St. James Sq., New Mills, Nr. Stockport
1951	Rayson, Mrs. M. C. J.	10 Heather Bank, Tower Road, Hindhead
1945	†vRead, W. J., M.Sc., F.R.I.C.	15 Carbery Avenue, Southbourne
1951	Read, Mrs. H. A.	" "
1957	Reakes, Rev. G. S., B.A.	The Cottage, 7 The Avenue, Branksome Park
1957	Reakes, Mrs. K. A.	" "
1945	Richards, Miss E. E., B.Sc.	8 Overcliff Mansions, Manor Road

1942	Richards, Miss M. C.	Stour Lodge, 21 Julian's Road, Wimborne
1958	Ridsdale, Mrs. M.	14 Erinbank Mansions, Manor Road
1966	Robbins, Miss R., M.Sc.	52 Burton Court, Chelsea, S.W.3
1949	Robertson, Mrs. M.	41 Christchurch Road
1954	Robertson, Miss V. L.	48 Crag Head, Manor Road
1966	Rollin, Miss P. E.	35a Holdenhurst Avenue, Boscombe
1964	Rose, Mrs. D., M.A.	5 East Avenue, Talbot Woods
1963	Rossiter, Mrs. D. M.	5 Park Homer Road, Colehill, Wimborne
1959	Rowe, Miss F.	23 Stourcliffe Avenue, Southbourne
1963	Rushton, Miss K. M., M.Sc., M.B., Ch.B.	20 Greenways, Highcliffe
1965	Ryde, K. A.	95 Barton Court Avenue, Barton-on-Sea
1965	Ryde, Mrs. M. K.	" "
1951	wSalisbury, Sir E., D.Sc., F.R.S., F.L.S.	Croindene, Strandway, Felpham, Bognor Regis, Sussex
1954	Saunders, Miss W. A.	11 Portman Crescent, Boscombe
1967	Screeton, Miss G. M.	B6, Exbourne Manor, 37 Christchurch Road
1938	Seare, Mrs. S. F. E.	Almer, Blandford
1951	wSecretan, S. D.	Swaines, Rudgwick, Sussex
1960	Sephton, Mrs. N., M.B., Ch.B.	Flat 1, 4 Talbot Avenue
1951	Sewell, Mrs. I.	4 Maundeville Crescent, Christchurch
1941	Sexton, Miss F.	60 Uplands Road
1966	Shelton, Miss V. A.	12a Iddesleigh Road
1950	Shillidy, G. A., C.I.E.	Flat 10, 31 St. Peter's Road
1937	Simmons, Mrs. I. M.	73 Spur Hill Avenue, Parkstone, Poole
1963	Simpson, Mrs. C.	Flat 46, Sunningdale, 28 Braidley Road
1966	Simpson, Mrs. D.	15 Gadbridge Court, West Cliff Road
1920	Simpson, N. D., M.A., F.L.S., F.R.M.S.	3 Cavendish Road
1961	Sims, G. P. W., C.Eng., M.I.Mech.E.	22 Duncliff Road, Southbourne
1961	Sims, Mrs. M.	" "
1959	Slater, G. A.	58 Wentworth Avenue, Southbourne
1959	Slater, Mrs. E. M.	" "
1963	Slater, Miss M. A.	" "
1959	Slieker, Miss H. R. M.	133 Seafield Road, Southbourne
1963	Smith, D. V. H., C.Eng., M.I.Mech.E.,M.I.H.V.E.	17 Little Forest Road, Talbot Woods
1963	Smith, Miss A. M.	" "
1964	Smith, Mrs. E. H.	44 The Grove, Moordown
1965	Smith, Miss G. M.	c/o Lloyds Bank, 45 Ealing Broadway, W.5.
1959	Soar, Miss I. M.	11 Grosvenor Road
1962	Sparks, Miss A.	"Chenies", Plot 47, Wick House Estate, Downton, Salisbury
1962	Sparks, Miss M.	" "
1965	Staples, E. G., M.A.	7 Easter Court, 31 St. John's Road, Boscombe
1962	Stiff, Miss F. A.	19 Heathwood Road, Winton
1962	Still, D. C., F.S.M.C., D.Opt.	56 Highfield Road, Moordown
1966	Storr, Mrs. W. W.	4 Moonraker's Way, Highcliffe, Hants.
1956	Stray, J. F.	Browngates, Barton Lane, Barton-on-Sea
1957	Stray, Mrs. S. V. M.	" "
1960	Sunderland, Mrs. R. B.	18 Spur Hill Avenue, Parkstone
1950	Sworder, Miss R.	c/o Barclay's Bank Ltd., 659 Christchurch Road, Boscombe
1962	Tarrant-Willis, F. E.	52 St. Osmund's Road, Parkstone
1955	Taylor, Mrs. B.	164 Belle Vue Road, Southbourne
1966	Thomas, Mrs. A. L.	Fern Lodge Hotel, Rosemount Road
1966	Thomas, J. G.	5 Pine Mansions, Vale Road
1966	Thomas, Mrs. C.	" "
1959	Thomas, J. W., B.Sc., LL.B. C.Eng., M.I.E.E.	4 Albemarle Court, Manor Road

1965	Thomas. W. C., M.A., B.LITT.	"Oriens", Dilly Lane, Barton-on-Sea
1965	Thomas, Mrs. G. M.	,, ,,
1964	Thorne, Mrs. M., B.A.	St. John's Vicarage, 1 Brunstead Place, Branksome
1966	Till, N. W. L.	165 Manor Road, Verwood
1966	Till, Mrs. A. M. E.	,, ,,
1965	Todd, Miss E. Crichton	53 Cliff Drive, Canford Cliffs
1966	Tozer, Miss D.	10 Clarendon Road
1961	Turnbull, A.	40 Southern Road, West Southbourne
1949	*Turner, G. A.	1 Poole Road
1959	Tyler, E. F.	43 Brackendale Road
1966	Tyler, Miss L. I.	,,
1950	Venning, Brig. F. E. W., C.B., C.B.E., D.S.O., M.B.O.U.	Pinewood, Butts Ash, Hythe
1950	Venning, Mrs. E. L.	,, ,,
1965	AWaldron, P. J.	19 Burleigh Road, Southbourne
1961	Waldy, Mrs. V. M.	The Paddocks, Dover Road, Branksome Park
1966	Walker, H. G., LL.B,	Hordle Dene, Hordle, Lymington
1955	Walker, Mrs. L. W.	12 Fernbank, St. Stephen's Road
1961	Wallace, Miss J. B., B.SC. (ECON.)	10 St. Ives Park, Ringwood, Hants.
1961	Wallis, Miss M. E.	2 Warren Avenue, Mudeford, Christchurch
1966	Wardroper, Mrs. L. A.	10 Rushton Crescent
1965	AWarn, R. M.	1a Warren Edge Road, Southbourne
1941	*†LWVWatt, Mrs. W. Boyd, F.Z.S., M.B.O.U.	52 Wimborne Road
1946	Watts, Miss N. E.	26b Cavendish Road
1947	West, Miss G. M.	The Knapp, Studland, Dorset
1961	Weston, Miss S. A.	Flat 2, Earlston, 8 Portarlington Road
1924	Whitaker, Miss E. M.	22 Somerset Road, Boscombe
1924	Whitaker, S. E., A.R.I.C.S.	22 Selwood Road, Addiscombe, Croydon
1962	White, Mrs. A. W.	4 Clifton Road, Southbourne
1963	White, Miss D. L. M.	23 Pinewood Road, Branksome Park
1963	White, Miss J.	,, ,,
1966	Wilson, Mrs. E. A. M.	23 Glenferness Avenue, Talbot Woods
1963	Winser, Miss M. M.	3 Mount Blairy, 23 St. Winifred's Road
1950	†vWinter, W. P., B.SC.	27 Horsa Road
1951	Winter, Mrs. H.	,,
1956	Wise, Mrs. B.	55 Namu Road, Winton
1959	Witherby, H. L.	9 Commercial Road, Parkstone
1960	Withers, A. E., F.A.I.	E41, San Remo Towers, Boscombe
1960	Withers, Mrs. D. E.	,, ,,
1948	AWood, Miss E. B., B.SC.	4 New Park Road, West Southbourne
1958	Wood, F. J.	17 Montague Road
1964	AWood, R. L.	,,
1956	Wood, T. E., M.A., LL.B.	21 Durley Chine Road
1953	Wootton, Miss E. M.	22 Elgin Road
1966	Woudstra, M.	2 Cecil Road, Boscombe
1966	Woudstra, Mrs. D.	,,
1949	†vWray, D. A., M.SC., PH.D., F.G.S.	42 Canford Cliffs Road
1956	Wray, Miss J., S.R.N.	,, ,,
1946	Wycherley, Mrs. L.	11 Hayes Avenue, Queen's Park
1965	Yeo, Miss M. L.	1 The Crescent, Naish Farm Estate, New Milton
1965	Yorke, Mrs. N. M.	15 Dingle Road, West Southbourne
1964	Young, Miss A. M., L.L.A.	6 Salisbury Road, Boscombe
1958	Yule, Mrs. M. P.	89 Orchard Avenue, Parkstone

BOURNEMOUTH NATURAL SCIENCE SOCIETY

Summary of the Accounts for the year ended September 30th, 1966

1964/65	Receipts	£ s. d.	£ s. d.
560 7 0	Subs. to Sept. 30, 1966	604 10 0	
66 1 0	Covenant Tax Refunds	67 10 3	
			672 0 3
	Rents, etc.		
310 12 0	Royal Commonwealth Society	259 11 8	
87 10 0	Camera Club	100 0 0	
			359 11 8
14 11 0	Royal Commonwealth Society, gas refund	20 9 0	
5 19 9	Telephone call box ...	8 15 9	
2 2 6	Projector fees	5 0 0	
18 17 6	Sundries	11 16 6	
			46 1 3
8 16 11	Field Meetings refunds	51 16 2	
41 11 10	Garden Party	38 0 6	
7 6 2	New Year Party ...	10 2 0	
13 8 3	Teas (net)	15 3 3	
			115 1 11
2 2 0	Donations	80 14 0	
270 9 8	Interest on Investments	255 14 0	
155 18 11	Income Tax refunds (interest)	164 5 7	
			500 13 7
	Total of Ordinary Receipts		1693 8 8

1964/65	Payments	£ s. d.	£ s. d.
135 13 9	Caretaker (Wages and Insurance)	137 16 3	
86 10 3	Insurance	88 3 3	
65 1 10½	Maintenance	385 17 11	
222 6 0	Rates	357 2 5	
			968 19 10
21 15 0	Coal	— — —	
141 5 5	Gas	140 5 5	
117 17 1	Electricity	125 11 0	
11 19 8	Water	12 6 6	
			278 2 11
49 13 6	Postages	61 11 7	
205 19 5½	Printing and Stationery	134 3 3	
94 0 0	Proceedings	89 15 0	
33 5 2	Telephone	34 0 6	
			319 10 4
60 0 0	Garden	90 0 0	
23 2 4	Library	15 1 7	
			105 1 7
15 18 0	Subscriptions to other Societies	18 0 0	
30 3 1	Sundry payments ...	16 18 3	
			34 18 3
	Total of Ordinary Expenses		1706 12 11

Receipts other than Ordinary							Payments other than Ordinary						
Transferred from Deposit Account ...				180	0	0	Purchase of Manchester Corporation Mortgage Bond				1600	0	0
Repayment of Borough of Barking Mortgage Loan				1600	0	0	Transferred to Deposit Account				255	0	0
Balance at Bank, 30.9.65	125	9	10				Balance at Bank, 30.9.66	36	10	9			
Cash in hand ...		1	8				Cash in hand ...		16	6			
				125	11	6					37	7	3
				£3599	0	2					£3599	0	2

We have examined the above Accounts with the Books of the Society and Vouchers for payments, and certify the same to be correct.

October 10th, 1966.

ALBERT V. LAWES
A. H. MIDDLEMAST } Auditors

F. J. WOOD, Hon. Treasurer.

DEPOSIT ACCOUNT

	£	s.	d.		£	s.	d.
Balance at Bank, 30.9.65	463	15	5	Balance of Deposit at Bank, 30.9.66	563	1	4
December 31st 1965, interest	24	5	11	Transferred to Current Account	180	0	0
Transferred from Current Account	255	0	0				
	£743	1	4		£743	1	4

CINE ACCOUNT

	£	s.	d.		£	s.	d.
Balance in hand, 30.9.65	30	0	0	Hire of Films	15	16	0
Subscriptions	25	17	0	Postages and Stationery		16	0
Donations	1	0	0	Balance in hand, 30.9.66	40	5	0
	£56	17	0		£56	17	0

LIBRARY ACCOUNT

	£	s.	d.		£	s.	d.
Balance at Bank and in hand, 30.9.65	56	15	1	Library Expenses	12	13	11
From Hon. Treasurer, refund of 1964-65 Library expenses	15	1	7	Library Maintenance	11	11	9
Sales of Books and Periodicals	25	14	8	Balance at Bank and in hand, 30.9.66	73	5	8
	£97	11	4		£97	11	4

FIELD MEETINGS ACCOUNT

	£	s.	d.		£	s.	d.
Cash in hand, 30.9.65	16	15	5	Expenses Field Meetings	4	18	3
Surplus from Coaches	63	11	2	Transferred to General Account	51	16	2
				Cash in hand, 30.9.66	23	12	2
	£80	6	7		£80	6	7

GARDEN ACCOUNT

	£	s.	d.		£	s.	d.
Balance brought forward, 30.9.65	1	16	8	Gardener	78	0	0
Per Treasurer	90	0	0	Turf Dressing	4	16	0
				Rose Trees	4	12	6
				Sundries	1	4	10
				Balance in hand, 30.9.66	3	3	4
	£91	16	8		£91	16	8

INVESTMENTS

	Cost			Value 30th Sept., 1966		
	£	s.	d.	£	s.	d.
£1000 British Transport 3% 1978/1988	775	4	0	550	13	9
£2000 County Borough of Bournemouth Mortgage Bond 5½% 1968	2000	0	0	2000	0	0
£ 200 County Borough of Bournemouth Mortgage Bond 5½% 1966	200	0	0	200	0	0
£ 500 County Borough of Bournemouth Mortgage Bond 6% 1969	500	0	0	500	0	0
£1500 Consolidated Stock 4%	979	0	0	843	15	0
£1200 4¼% British Electricity Stock 1974-1979	984	4	0	901	10	0
£ 600 6% Exeter Corporation Loan 6¾% 1971	600	0	0	600	0	0
£ 500 6½% Borough of Swindon Mortgage Loan 1970 ...	500	0	0	500	0	0
£1600 Manchester Corporation Bond 6¾% 1972 ...	1600	0	0	1600	0	0
	£8138	8	0	£7695	18	9

Report of the Council for the year ending 30th September, 1966

The activities of the Society have again been sustained on a high level. The Chairmen of Sections have provided for members a full and varied programme comprising 53 lecture sessions, 49 field meetings, 7 Cine subscription meetings and 8 Members' Days. The thanks of the Society are due to them as well as the lecturers and leaders, and also to the Honorary Curator, the Honorary Librarian and their helpers for the continuing improvements in the Museum and Library, both of which are being more and more used. The Society's excellent range of modern visual aids have been operated week after week, and often several times a week, with unfailing devotion and skill by the Honorary Projectionists and their assistants.

At the Society's premises a high standard is maintained by the House Committee and the Garden Committee. An increasing number of members now stay to tea after lectures, thanks to the efficient service of the Tea Committee. Both the New Year Party and the Summer Garden Party owe a great deal to this same committee and to the Entertainments Committee, who have continued the good work done by Mrs. Simmons for so many years. Many other members give their time and service in unobtrusive ways, as does, for example, Mrs. Cox who continues to address envelopes to all members six times a year. Mention ought also to be made of Mrs. Lever who helps in so many varied ways.

National Nature Week was actively supported by the Society. The premises were open to the public, and many visitors appreciated the exhibits in the Museum and the specialist rooms. On April 27th talks were given by Mr. G. B. Ryle, C.B.E, Chairman and Conservation Officer of the Hants. and Isle of Wight Trust, on Conservation; by Miss H. M. Brotherton, O.B.E., J.P., Hon. Secretary of the Dorset Naturalists' Trust, on the Nature Reserve on Brownsea Island; and by Mr. M. T. Horwood, Warden-Naturalist of the Nature Conservancy at Furzebrook, on deer preservation in the Isle of Purbeck. On April 30th members' transparencies were used by Chairmen of Sections to show the effects of the varied local geology on the scenery and the natural habitat of the fauna and flora.

It has been a pleasure to welcome again to our platform young scientists who are still at school. In a full-length lecture on one occasion and in three separate papers on another, these young sixth formers, this year from St. Peter's School, proved themselves to be very well informed and able to organize, expound and describe difficult material fluently and competently.

The Council very much regretted that the Honorary Secretary, Mr. G. A. Slater, felt for personal reasons unable to carry on in his office. His resignation was accepted most reluctantly and

with the Council's warm thanks for all the services he has rendered in the past.

Membership of the Society at the end of the year was 434—the third successive year in which there has been a small fall in membership. The balance has been struck by 69 new members on the one side, and 23 deaths, 59 resignations and 14 lapsed memberships on the other.

Many members perhaps may not previously have realized the size of the membership turnover. We are fortunate in getting quite a large number of new applications each year, but by and large these barely balance those who for one reason or another cease to be members. The Council has had this problem much in mind during the past year, including the need for increased publicity, for as indicated last year the Society would be strengthened by an increased membership. Everyone can, of course, assist in this endeavour by making the Society as widely known as possible, for with its wide range of subjects our Society has something to offer anyone interested in science. In this connection the afternoon meeting for new members was obviously a success.

One of the innovations of the year was the establishment of a Panel of Visitors under the Chairmanship of Brigadier A. B. D. Edwards, C.B.E., M.C., which is now in operation.

The thanks and good wishes of the Council go to two Chairmen of Sections who passed their duties on to younger members at the end of the session. Both are past Presidents of the Society and both have been, and are, scholars of the front rank. Mr. H. E. Clarke, M.A., B.Sc., F.R.I.C., has for many years chaired the Physics and Chemistry Section and Mr. W. P. Winter, B.Sc., has similarly chaired the Astronomy Section, each with great distinction. The Council wishes also to record with pleasure that Mrs. I. M. Bircumshaw, B.Sc., has taken over from Mr. Clarke, and Mr. C. M. Pither, F.R.A.S., F.I.L.S., from Mr. Winter.

The Society has continued to receive valuable gifts in kind, and perhaps special mention should be made of Mr. W. E. Pring of Colehill, Wimborne, who gave nine cases of African butterflies, and Mr. and Miss Whitaker who gave several cases of slides. The Council has also received donations of £50 from the Misses Penrose to mark the 50th anniversary of their membership and £25 from Mrs. Boyd Watt to mark the 25th anniversary of her membership.

The year has brought the death of the following members, whose names are here recorded with deep regret: — Mrs. A. Atkinson (1957), Mr. J. H. Bailey (1950) Hon. Member, Mr. T. H. Bickel (1942), Mr. A. H. Byrt, C.B.E. (1954), Miss H. M. Chambers (1955), Mrs. A. M. Cheesman (1945), Mr. H. A. Cooper (1926) Hon. Member, Major C. L. Cooper-Hunt, M.A., R.A.Ch.D. (Retd.) (1945), Mr. J. W. Corby (1957), Mr. W. S. I. Cox, F.R.E.S. (1948), Mr. A. Cromey-Hawke (1966), Prof. F. O. B. Ellison, M.D., F.R.A.S. (1946), Miss V. G. Hayley (1949), Miss J. Knight (1959),

Mr. B. Lightfoot, O.B.E., M.C., M.A., F.G.S. (1960), Mr. W. J. B. Mabley (1965), Mr. C. A. Moss (1955), Mrs. E. Owen (1944), Mr. H. E. Piggott, O.B.E., M.A. (1960), Miss E. M. Roden (1923), Mrs. M. C. Smith (1963), Mrs. S. Somerville (1940), Miss E. J. L. Venning (1950), Miss F. H. Warden (1952), Mrs. G. E. Williams (1955).

Mr. Bickel filled the post of Honorary Secretary for four years, putting in a great deal of time and hard work during a period of reorganization and rebuilding. Mr. Cooper, who had been a member for 40 years, contributed very generously to the Society's funds, enabling considerable improvements to be made to the amenities provided to members. Major Cooper-Hunt was at one time a very active member and served for a short period on the Council. Appreciation of the work of Mr. Bickel, Mr. Bailey and Mr. Cox appears on pages 21, 22 and 23.

Finally the Council wishes to thank all members who in one way or another have assisted in the running of the Society. Ours is a co-operative effort and only by every member taking some share in the work is the Society likely to reach its highest potential. New members, particularly, are to be encouraged to offer their services to any Committee Chairman if they would like to assist in the work of that committee in any way.

AFFILIATIONS

The Society subscribes to the following organizations:— National Trust, Botanical Society of the British Isles, Council for British Archaeology, Council for Nature, Council for British Ornithology, Hampshire and Isle of Wight Naturalists' Trust, Dorset Naturalists' Trust, South-Eastern Union of Scientific Societies, South-Eastern Area Museum Service. The Society is affiliated to The British Association for the Advancement of Science.

PUBLICATIONS RECEIVED

The following publications were received in the Library during the year. Some of them were gifts from members who subscribe personally to the particular Society. The Library Committee are glad to record their appreciation of such gifts.

1. Publications issued by a Society

Birmingham Natural History & Philosophical Society—*Proceedings.*
Botanical Society of the British Isles—(1) *Watsonia,* (2) *Proceedings.*
Bristol Naturalists' Society—*Proceedings.*
British Association for the Advancement of Science—*Science.*
British Deer Society—*Deer News.*
British Trawlers' Federation—*Report and Pamphlets.*
British Trust for Ornithology—(1) *New Bulletin,* (2) *Bird Study.*
California Academy of Sciences—*Proceedings.*
Cambridge Antiquarian Society—*Proceedings.*
Carnegie U.K. Trust—*Annual Report.*
Cotteswold Naturalists' Field Club—*Proceedings.*

Council for Nature—(1) *News for Naturalists,* (2) *Habitat.*
Croydon Natural History & Scientific Society—*Proceedings.*
Dorset Natural History & Archaeology Society—*Proceedings.*
Fair Isle Bird Observatory—*Annual Report.*
Fauna Preservation Society—*Oryx.*
Geological Association—*Proceedings.*
Hampshire Field Club & Archaeology Society—*Proceedings.*
Hampshire Field Club: Ornithological Section—*Bird Report.*
Hastings Natural History Society—*Journal.*
Hertfordshire Natural History Society—*Transactions.*
Historical Association—*Pamphlets.*
Isle of Wight Natural History & Archaeological Society—*Proceedings.*
Linnean Society of London (Botany)—*Proceedings.*
Lloyd Library & Museum, Cincinnati—*Lloydia.*
Men of the Trees—*Trees and Life.*
National Coal Board—*Coal Quarterly.*
National Trust—*News Letter.*
North Gloucestershire Naturalists' Society—*Journal.*
Osaka Museum, Japan—*Bulletin.*
Royal Commonwealth Society—*Journal.*
Royal Horticultural Society—*Journal.*
Royal Society for the Protection of Birds—*Bird Notes.*
Senckenbergischen Naturforschenden—*Natur und Museum.*
Severn Wildfowl Trust—*Annual Report.*
Smithsonian Institution, U.S.A.—*Annual Report.*
Societé Jersiaise—*Annual Bulletin.*
South-Eastern Union of Scientific Societies—*Proceedings.*
South London Entomological & Natural History Society—*Proceedings and Transactions.*
Torquay Natural History Society—*Transactions and Proceedings.*
Tromso Museum, Norway—(1) *Astarte* (*short papers*), (2) *Acta Borealia.*
Upsala University, Sweden—*Acta Phytogeographica Suecica.*
U.S. Information Service—*Pamphlets, Science Horizons.*
West Wales Naturalists' Trust—*Nature in Wales.*
Zoological Society of London—*Newsletter.*

2. Periodicals received

Nature, British Birds, Antiquity, Geographical Magazine, Animals, Science Journal.

Obituaries

Joseph Henry Bailey

Mr. Bailey was born in Crewe in 1883 and there he was educated, passing out in due course into the Civil Service in the Customs and Excise Department. After wide experience in many parts of the country he rose to high office at the Port of London.

Mr. and Mrs. Bailey joined our Society in 1950 and became active members almost immediately. His meticulous accuracy and speed in handling accounts soon made him a great help with the finance of New Year and Garden Parties and many excursions. His first official post was Chairman of the Library Committee in 1955, and in 1957 he accepted the exacting duties of Editor. Better known was his organization of the Cine Subscription Programmes which he took over in 1958 and carried on for years with consistent success.

Mr. Bailey was a kindly man whose modesty concealed his activity and generosity in helping needy persons and causes. His private attainments were not generally known. He was a leading amateur actor, a pianist and organist and conductor of his own small orchestra. His patient skill as wood-carver, painter, illuminator and calligrapher produced works which still give great pleasure.

Mr. Bailey's service to the Society was rewarded with his election as Honorary Member in 1965. He died on the 31st May, 1966 and is survived by Mrs. A. Bailey, herself an Honorary Member, who is assured of our deep sympathy at her own great personal loss.

Thomas Harold Bickel

Mr. Bickel died on October 13th, 1965. During the last few years of his life he devoted much time and labour to the B.N.S.S., which he had joined in 1942. It is only three short years since he was so strenuously engaged as its Honorary Secretary, a post he filled from 1960 to 1963 during a difficult period of change and the renovation of the premises. His colleagues, and indeed all the active members, held him in the highest regard, not only for his routine work but also for the quality of his judgment and his kindly tact.

Mr. Bickel was born in Taunton in 1894, and entered the firm of J. J. Allen in 1910. At the beginning of the first world war he joined the Devonshire Regiment, serving in India and Mesopotamia, and India again as a captain in the Waziristan campaign. After the war and seven years in London he was back in 1927 with J. J. Allen. By 1941 he held a high managerial post, and was soon to become Joint Managing Director. An acknowledged expert on new and antique furniture, he served on the national council of the furniture trade, published a textbook for students, and was a member of its examining body. He lectured on the subject also for the W.E.A.

A list of some of Mr. Bickel's lectures at the B.N.S.S. reveals the range and depth of his interests: Prehistoric Dwellings in England, Norman Keep to Tudor Mansion, The Links of our Furniture with History and Custom, Old English Household Life, Chippendale and his Contemporaries. As a permanent background to all this and to his family life was his religion. He was a life deacon of Immanuel Congregational Church, and a leader in many of its activities. Mr. Bickel was a most modest, gentle man. He once lectured to the Society on some of his wartime experiences, but characteristically refrained from mentioning the decoration he had received for rescuing a native soldier from drowning in a Mesopotamian river. He left a widow and a son, to whom we, who also miss him sorely, would offer our condolences.

William Saye Ilston Cox

Born in London in 1873, Mr. Cox, the tall, strong and respected nonagenarian, was active among us to the end of his life. He died on 21st May, 1966, mourned by Mrs. Cox and all members of the Society. From boyhood he had a passionate interest in Natural History, especially in Entomology, and in his youth ranged the countryside on his bicycle in quest of butterflies and moths. He often recounted his interesting experiences and adventures particularly in the Fens and Essex Marshes.

His business life was spent in London as a leading member of a firm of printing ink manufacturers. He had a great interest in, and acquired deep knowledge of, the Livery Companies and Trade Guilds of the City, about which he gave us occasional lectures; he had been for many years a member of the Stationers' Company and a Freeman of the City of London.

In 1930, Mr. Cox married the lady who is so well known to members. On retirement in 1946 they came to reside in Bournemouth and joined the B.N.S.S. in 1948. From 1950 to his recent retirement Mr. Cox was Chairman of the Entomology Section, and many members will recall with pleasure the lectures he arranged and the field meetings which he organized and led. It was typical of his nature that he was still, at over 90, addressing the "Yellow Paper" envelopes to all members of the Society six times a year. The Society extends its condolence and sympathy to Mrs. Cox.

Reports of Sections for the year ending September 30th, 1966

Library

The majority of our books have now been arranged systematically on the shelves. Work has started on the review of the numerous booklets, loose papers, etc., presented to the Library over the years.

The Library Committee records its thanks to those members who have presented books during the session and which include: — *Rural Rides* by Richard Fitter, *Sambra and the Monkey Mind* by Leonard Williams, *Dawn, Dusk and Deer* by A. Cadman. Books which have been purchased include the following: — *Collecting Coins* by Frank Purvey, *Flowers of the Mediterranean* by Polunin and Huxley, *Portrait of Dorset* by Ralph Wightman.

H. S. Holbrook

Museum

Examination of the contents of the Museum continues. This has necessitated much cleaning, and at times some carpentry, in which the regular work of Mr. H. C. Blackmore and Mrs. V. W. Eaton is much appreciated. Thanks are also due to Dr. T. M. Bell for his help in re-labelling the mammal skulls, to Mrs. V. Follett for checking the lists of birds and eggs, and to Mr. and Mrs. C. G. Pickering for bringing the nomenclature of the fungi models up to date.

Displays on the Hall table, have, it is hoped, indicated what varied and interesting collections are contained in the Museum. A selection of exhibits was shown at the Punshon Memorial Hall in connection with an Adult Education Local Studies Course, Miss K. F. Masters and Miss W. A. Saunders kindly helping with transport.

During National Nature Week a small exhibition in the Museum had as its theme "Extinction *versus* Preservation", contrasting the slow processes of extinction in the past with the modern possibilities of much more rapid extinction, thus stressing the need for more conservation. In the Hall, "Mining in Cornwall" showed specimens from the geological collection, and in the Botany room Mrs. A. K. Hunt had arranged an attractive exhibition of "Spring Flowers". All these displays owe much to the generous co-operation of Mr. H. S. Holbrook, the Hon. Librarian.

The diagrams recently mounted in the Hall by Mr. C. M. Pither have brought the Astronomy exhibits into prominence. The finding in the Egyptian collection of the lithographs of Belzoni's Tomb Paintings has been an exciting event leading to some fruitful research. Mr. A. J. Butcher has made slides from these prints.

Eight Members' Day meetings have been well attended. The series was introduced by the Hon. Curator with a talk on the history and contents of the Museum, and concluded by Mr. J. C.

Mitton giving a lecture on the Bayeux Tapestry, illustrated by slides of his own making. As the facsimile of the Tapestry was on view in Bournemouth almost immediately afterwards, this lecture was of particular interest. Reports of the other meetings are included under individual Sections.

A large party of members made a visit to the Red House Museum, Christchurch, when Mr. J. H. Lavender, the Curator, gave a short preliminary talk on the history of the Museum.

Acquisitions during the year included specimens of Granite from Aswan Quarry (Mrs. E. M. Fildes), Egyptian Lamp and Tear Bottles (Brigadier A. B. D. Edwards), Minerals and Fossils (Dr. D. A. Wray), Shark's Tooth (Mrs. O. E. Murch), Zoological Specimens from Venezuela (Mr. E. Chambers), Indian Native Craft Work (Miss R. Sworder), two Algerian Vases (Miss E. M. Whitaker), a cabinet of glass-fronted drawers and a collection of Seeds, Shells and Fossils, etc. (Mr. W. R. Woodhouse from the Estate of his father, the late Mr. W. J. Woodhouse), a collection of African Butterflies (Mr. W. R. Pring of Wimborne), Rocks (Mrs. B. Taylor). The thanks of the Society are offered to all donors.

The Hon. Curator is especially grateful to the Chairmen of Sections for their expert advice and kind help.

N. SEPHTON

Slides Collection

The work of sorting, editing and listing the many slides owned by the Society is proceeding, but in view of the mass of detail involved, progress is rather slow. Lecturers have made use of slides from the collection on several occasions. This use appears to be increasing as the contents of the collection and their availability become better known to lecturers.

During the year we have received a number of slides from various sources, including a set of hand-coloured Japanese slides from Mrs. Bickel, and two collections of monochrome slides, one from Mr. and Miss Whitaker, and the other from the Estate of the late Mr. W. J. Woodhouse.

J. C. MITTON

Garden

Valuable help has been given during the year by Mrs. V. O. A. A. Goulton, Miss I. K. Burroughs, Miss H. I. Payne and Mr. V. T. Pickering. Shrubs have been given by Mr. and Mrs. G. Ollier and Mrs. C. D. M. Goldie, and bulbs by Mrs. M. K. Gompel. All helpers are welcome on Tuesday mornings, when I try to be there, or at any other time.

W. CHOME

Archaeology and History

This year the Section organized six lectures, two field meetings and two Members' Day talks on the archaeological objects in the Museum.

The first lecture was delivered by Mr. E. Chambers, F.L.S., on "York City and its Minster", knowledgeable and made most interesting by reminiscences of the lecturer, himself a Freeman of the City. "The City of Exeter" was the lecture in March, when Mr. F. W. Moss gave a most interesting and informative talk on this lovely city. The Chairman, recently returned from her archaeological tour of Egypt and the Greek Islands, gave two lectures, one on Minoan Crete and the other on "Egypt (The Eighteenth Dynasty)". On another occasion she read a paper on Pompeii, illustrated by slides on loan from the Hellenic Society.

Our old friend Mr. Whitaker delighted us again with the architectural beauty in his lecture on French Cathedrals and a vivid portrayal of their principal features. The Egyptian collections in the Museum were exhibited by the Chairman on two Members' Days. In the second she described the wonderful Belzoni prints of Tomb Paintings, etc., recently brought to light in the Museum and identified as the Folio Prints of the original work of the great archaeologist and published by him.

The first field excursion was a visit to Lacock Abbey, which was originally a convent, later converted into a mansion of great beauty. On the way there, we had called at Bradford-on-Avon to view the mediaeval tithe barn and the church with its two sculptured angels above the chancel arch, the only purely Saxon church in the country. On the way home we visited the Norman church of St. John, at Devizes, to see the magnificent three-arched Norman chancel. The Vicar kindly pointed out the chief features of the church and its history. A fine example of a Mass Dial can be seen here.

On the excursion to Maiden Castle we first called at Dorchester Museum, where Miss Samuel, the Assistant Curator, gave a most informative talk on the great Iron Age Fort and showed us the artifacts recovered from excavations on the site. After visiting Colliton Park Roman Villa and Maumbury Rings the party went on to Maiden Castle. In ideal weather we ascended the steep slopes of the Fort, pausing at the small Romano-British temple, and then walked round the ramparts. The last call was at Athelhampton House, where we were escorted by the Secretary, an expert guide, and allowed to roam in the beautiful Elizabethan gardens.

We also participated in a memorable visit one September evening to Salisbury Cathedral for "Son et Lumière". We sat in the Cathedral precincts, listened to its story and gazed at the spire, with its cross softly glowing against a background of stars.

The lectures and field meetings were well attended, and the Chairman is very grateful for all the help and support received.

C. Simpson

Astronomy

On October 23rd the Chairman continued his talk on the Quasi Nebulae began during the previous session. The distance of the "Quasars" is measured by determining the "red shift" of a line in the spectrum that is $\frac{\lambda - \lambda o}{\lambda o}$ where λ is wave length determined telescopically and λo as seen in the laboratory. For example the spectrum of 3C−254 shows five observable "shifted lines" $\frac{\lambda - \lambda o}{\lambda} = Z$ all giving the value of Z though λ varies from 3314 to 6705, that is from violet to red. At the time of speaking the farthest Quasar was 3C−9 giving a value of Z of 2·012, indicating velocity of recession from us of about 150,000 million miles per second, or 82% of the velocity of light. For the farthest galaxies greater accuracy requires the use of Einstein's special theory.

On March 19th the Chairman gave a summary of the progress of astronomy from Miss Leavitt's work in 1905 on the distance between our own nebula and that of Andromeda until Hubble's Law was formulated in 1931. On November 20th Mr. C. M. Pither, F.R.A.S., lectured on the Red Planet, Mars. After a brief sketch of the main features of the planet's surface he described the orbit followed by the probes which secured the photographs taken at short distances and which marked an important stage in our knowledge of the planet.

On January 15th Mr. W. H. Day, F.R.A.S., described the work and renown of the Astronomers Royal, who from 1662 to our own time have directed the regular work of the Royal Observatory, such as the control of the world's time, as well as the conduct of various important researches of public as well as of international concern.

On February 19th Mr. W. H Whittle, C.Eng., M.I.M.E., spoke on "The Sun and His Family", which he illustrated by a very fine collection of specimens of astronomical photographs which showed an immense number of points of view of the sun. To a large number of Mr. Whittle's audience these must have been entirely novel.

On April 16th Mrs. Gillian Hansford, B.Sc., of the Southampton Astronomical Society, lectured on "The Astronomer's Idea of Distance", an idea which she showed had greatly widened. After touching briefly on the "ante 1800" measurements, she showed that our modern estimates of distance were founded on the work of Hubble at Mount Wilson from 1924 onwards, and of late computed on the "red shifts" of receding stars and galaxies. Hubble's Law states that

$$\text{Velocity} = \text{a constant} \times \text{distance}.$$

If we are dealing with galaxies with velocities small compared with that of light their speed is given by

$$V = CZ$$

where C is the velocity of light, Z the red shift and V the velocity.

I conclude by thanking all who have lectured in 1965-66 whether members or visitors, in particular Mr. Pither, whom we now welcome as Chairman of the Section. My thanks are due to the members of the Southampton Astronomical Society who have so kindly helped me for years past, and I am very pleased to know that Mr. Pither has already received offers from several of these to continue their very welcome assistance.

W. P. WINTER

Botany

This Section provided a full and varied programme of activities during the year, with 7 lectures and 17 field meetings. Two of the lectures were by visitors new to the Society. Dr. J. K. Hasley, M.B., B.S., of Dorchester, talked on "Wild Orchids of Hampshire and Dorset", describing the habitats of the orchids and their long, complicated life-histories, and illustrating his talk by colour slides of his own taking. Secondly, Mr. D. F. Westlake, B.Sc., M.I.Bio., of the Fresh-water Biological Association, which now has a river laboratory at East Stoke, Wareham, gave a most interesting account of the work of the Association, with special reference to that done locally.

Miss M. MacKeith, B.Sc., who is now a member of the B.N.S.S., lectured to us for the second time, choosing as her title, on this occasion, "Some Unusual Methods of Plant Nutrition", always a fascinating subject, particularly with regard to the plants which obtain their nitrogenous food from the bodies of small insects.

Mr. J. H. Lavender, B.Sc., Curator of the Red House Museum, Christchurch, visited us again after some years, and gave a most illuminating account of "The Ecology of Local Wild Plants, a Study in Changing Environment". No one living in these parts can fail to realize the speed with which changes have taken place, transforming large areas from rural to urban conditions, with the consequent loss of wild life of all kinds. Mr. Lavender spoke of the important work done by such bodies as County Trusts in preserving some areas in their original states.

The remaining lectures of the winter season were given by the Chairman: "Mosses and Liverworts" was an account of the life-histories of these flowerless plants and was illustrated by slides showing their structure as seen under a microscope; "Poisonous Plants" detailed some of the types of poison produced by various well-known plants.

The summer lecture, given by Mr. E. Chambers, F.L.S., was entitled "Consider the Lilies". In it he showed how misleading common names can be, as so many so-called "Lilies" do not belong to the Liliaceae at all!

The organization of Field Meetings has been greatly assisted by the co-operation of members both new and old who have

volunteered as leaders and have introduced us to several botanically interesting venues which had not been visited before.

Mr. and Mrs. V. T. Pickering again organized the Fungus Foray for which they obtained special permission to take cars through the Forest tracks from Brockenhurst to Denny Woods. September was such a dry month that they feared no Fungi would be seen, but fortunately there was rain prior to the date fixed, and in fact eighty species were identified.

Gardens visited were Yaffle Hill, by permission of Mr. C. Carter, who with Mrs. Carter kindly gave the afternoon to showing the party the many unusual shrubs which they are growing; and Exbury Gardens, an old favourite.

Travelling by coach, parties visited Portland, calling at Smallmouth en route and later Hatchet Pond, and were thus able to contrast the plants found in salt and fresh-water marshes, in addition to finding many typical examples of a chalk habitat on Portland itself; they also visited Hambledon Vineyard on another occasion, by permission of Sir Guy and Lady Salisbury-Jones, and learned the art of wine-making.

During the month of May the Pharmaceutical Society of Great Britain held an exhibition at Beale's entitled "Medicines with Care", and the B.N.S.S. was approached regarding mounting a display of poisonous plants. Several members of the Botanical Section helped to collect and arrange this, and kindly gave up some of their time to attend the exhibition and help in the supervision of the exhibits. In spite of the earliness of the date of the exhibition, quite a creditable display was produced, thus giving the Society some publicity.

In conclusion, we wish to express our grateful thanks to all the lecturers, leaders and others who make it possible to continue to provide such a full programme of activities.

A. K. Hunt

Geography

One of the aims of the lectures is to give members a first-hand account of countries which are very much in the news, so that they can gain a better understanding of the problems involved.

Iceland, with its recently erupted volcanic island and the disputed extension of its territorial waters for fishing, had been visited by Mr. O. Hook, F.Z.S., who gave an interesting account, with colour films, of this remote but quite prosperous island. Mr. S. M. Wheatley's experiences during several months spent in Rhodesia enabled members to appreciate more fully the difficulties facing that country. Dr. D. Odlum, M.A., who had travelled from Canton to Peking, described the great changes taking place in the New China, and also the desire to keep alive many old traditions associated with its ancient civilization.

Small and geographically unfavoured Israel has made great strides since it was founded in 1949; irrigated fields, mines and factories now appear in areas which formerly were scantily peopled or barren wastes. After a visit to Israel the Chairman discussed some of the changes which had been brought about so quickly by Jews returning from many regions at widely different stages of economic development. On another occasion she spoke of her visit to Athens, Crete, Rhodes and Corfu, and described in detail the buildings and the countryside seen in all its Spring glory.

Another aspect of much the same area was the subject of a talk on "The People of Rural Greece—a vanishing way of life" by Mrs. M. Grange-Bennett, who had spent a considerable time visiting and studying the isolated communities in some of the Greek Islands. With the vivid description of the scientific geographer, Mr. W. F. Perry, B.Sc., F.R.G.S, using his own beautiful transparencies, brought to life the splendid scenery of Norway. We are indebted to those explorers who first ventured across uncharted seas and into unknown lands, but the work of some of these has never received full recognition. It was of some of these lesser known explorers that Mr. E. Chambers, F.L.S., spoke in his lecture, "Into the Unknown".

FIELD MEETINGS. July 6th. Hengistbury Head is a happy hunting ground for all natural scientists. A party of geographers went to study the site of the ancient trading centre, the 19th century iron works, and the cliff erosion and protection works. At the Lily Pond they were pleased to be joined by Mr. K. G. Goodyear, F.R.E.S., the Chairman of the Entomology Section, who showed them several species of dragon fly; and by Mr. A. Windebank, who has made a study of a small crustacean, *Corophium volutator*, living in the shallow tidal waters of Christchurch Harbour.

June 29th. Land Utilization was the subject of a visit to Brownsea Island, which since it was taken over by the National Trust has been divided into three parts: (1) the lagoons and lakes on the north side, administered as a Nature Reserve by the Dorset Naturalists' Trust, where from the three sides it is possible to watch the abundant bird life—in the heronry, on the artificially constructed "tern" islands, and in the shallow lagoons at low tide; (2) the higher central part under the care of the National Trust, with its quay, small village and church, the whole now cleared of undergrowth to enable visitors to enjoy the wonderful view of the lands around Poole Harbour, notably the whole sweep of the chalk hills in the Isle of Purbeck; (3) the strategic point guarding the entrance to the harbour, where there has been a castle since the time of Henry VIII. The Society had permission to visit this private property to see the Lower Bagshot beds of Tertiary age, where Mr. R. Warn showed members the strata in which he had made interesting finds of fossil vegetation—Magnoliales, Lauraceae, and Sapendaceae (Willows).

August 3rd. The settlements of N.E. Dorset show very clear geographical controls. The market town of Wimborne, clustering

round its Minster, stands at the confluence of the rivers Stour and Allen, whereas Blandford (where the President gave a talk on its Georgian architecture) commands the Stour gap through the chalk hills. The present settlements of Cranborne Chase are situated in the valleys, but the early villages are situated on the uplands. These latter are joined by the Ackling Dyke or trackways and are surrounded by long and round barrows and earthworks, while from Gussage to Pentridge runs the ceremonial Dorset Cursus.

May 3-6. The most ambitious field meeting was a four-day visit to Cornwall, where botanists and archaeologists as well as geographers found much to interest them. The intensely folded strata and volcanic intrusions in the cliffs at Boscastle, and the sea action in the blow holes; the thermal contact with the molten magma round the granite hills, producing veins of copper, tin, and other minerals, as well as kaolization; the ancient serpentines of the Lizard Peninsula, giving magnificent scenery, especially at Kynance Cove—all these proved of great interest to the geomorphologists. At St. Michael's Mount the party welcomed Mr. W. A. Stinton, a former member of the Society, who with his wide local knowledge was able to show us many interesting features, such as the 15th century "indulgence" harbour and the tidal observatory at Newlyn, many Celtic crosses and standing stones, a fougou and a chambered burial place. The Communications Satellite tracking station on Goonhilly Downs formed a complete contrast to the Marconi Memorial at Poldhu, for from the radio station at the latter the first radio signals were sent across the Atlantic.

It was gratifying that more than 120 members attended the Summer field meetings, many of them several times. The Chairman would like to thank all lecturers and those who attended the meetings, thereby contributing to making 1965-66 a very successful year for the Section.

F. M. Exton

Geology

During the session three lectures were given on widely varying aspects of geology. In January, Brother Dennis of St. Peter's School, Southbourne described the Church Stretton district in Shropshire, a well-known centre for the study of Precambrian and ancient rocks. His account was greatly enhanced by many excellent photographs and diagrams.

In February we had an interesting account of the geology and geomorphology of Spitzbergen given by Mr. David Gee. Mr. Gee had been a member of several Cambridge University expeditions to that country and had later worked with the Norwegian Geological Department there. The glaciation of this region was illustrated by a striking series of his own colour slides.

In March the Chairman of the Section, in a talk on the Geological Section of our Museum, gave a somewhat detailed account of the many remarkable geologists and others who had been associated with its growth and development.

D. A. Wray

Photography

Some of the finest examples of the photographic art were shown during the year. Dr. T. M. Bell, who opened the session with a talk and slides on "Yugoslavia, Flowers and Lakes", was as usual most interesting. Mr. Simpson Low, using very artistic slides in "Colour Photography on Holiday", took us on a wide and varied journey. We were fortunate to have Mr. D. J. Dudley's superb slide show, "Come to the Hills", done by dual projection and magnificent tape recording. For one short hour we were indeed transported to the Scottish Highlands. Another tape-recorded programme was given by Mr. K. W. Harbridge of the Bournemouth C.C., who showed his "Odyssey 1964", a journey to Greece.

Mr. G. Holroyd came down from his projection box to give his Lecture "Pearl of the Mediterranean, Mallorca". Although he threatened that this was to be the last, we hope he will change his mind. Mr. R. T. Bruton, A.R.P.S., of Southampton, who is no stranger to the Society and produces some of the finest slides in the country, took us on "The Magic Carpet" to many lands. Finally Mrs. Irene Dudley brought the session to a close on a Scottish note with her interesting talk "The Clans and their Territories", illustrated by lovely slides. She had the advantage of Mr. Dudley's help with dual projection and tape recordings. The Chairman would like to thank the lecturers and also the projection panel under the leadership of Mr. G. Holroyd.

U. M. OGLE

Physics and Chemistry

The session opened with a further welcome visit from Mr. J. E. Parry, M.A., B.Litt., whose theme, "A Matter of Taste and Choice", led very naturally to a useful discussion regarding the present serious drain of trained and talented scientists from our universities and colleges of technology to posts overseas.

The session under review is noteworthy for the attention devoted to two other vitally important problems of scientific economics, viz. (1) the provision of means for checking the destruction and loss of food and materials by fungal and bacterial depredation, and (2) the supply in adequate measure of water, in a state of acceptable purity, to meet the needs of growing populations, industries and agriculture of the world. To deal with the former of these issues we had the pleasure and advantage of a lecture, illustrated with transparencies, by Mr. N. I. Hendy, F.L.S., of the Admiralty Materials Laboratory, Holton Heath. Mr. Hendy showed how some of the presumably most resistant materials are frequently attacked by fungi, and so destroyed or rendered useless. The writer concentrated on measures which have to be taken to protect from bacterial destruction essential foodstuffs, whether designed to be used in a fresh state or packed for consumption after a period of storage.

The shortage of water is probably the world's most fundamental human problem in the survival and development of nations. The writer devoted two lectures, illustrated by episcope, to the question of desalination of salt, brackish and polluted waters, whereby they can be improved to a degree of purity necessary to supply all needs in regions where water is especially deficient or industrially contaminated. He emphasized the importance of generating the heat, required in many desalination techniques, by the use of nuclear fuel. On the Antarctic continent a comity of nations already prepares fresh water in this way from the ocean, which is both a simpler and cheaper procedure than the apparently obvious alternative of melting the ubiquitous snow and ice with conventional fuels!

In relinquishing after many years the chairmanship of this Section the writer extends to his successor, Mrs. I. M. Bircumshaw, B.Sc., the sincerest wishes for the future, and would appeal to all members of the Society for their active help, goodwill and co-operation.

H. E. CLARKE

Zoology

ENTOMOLOGY

The weather this summer has not been particularly good, and many insect populations were not at their best, many species emerging late and finishing early, while a few rarities do not appear to have made an emergence. At the time of writing (late September) *Sympetrum danae, Sympetrum striolatum* and *Aeshna mixta* were on the wing, together with odd specimens of *Aeshna juncea* and *Aeshna cyanea* **(ODONATA).**

ODONATA. ANISOPTERA. *Gomphus vulgatissimus* emerged in good numbers at its classical Hampshire locality. Many exuvae in late May. Three colour exposures were taken of an adult. *Aeshna mixta* is arriving in the area each year. Evidence of breeding (nymphs, exuvae or teneral specimens) is urgently required as it has been proved to breed in this country. *Cordulia aenea* has unfortunately been deprived of a habitat by the filling in of Burley Pond on Blackwater in the New Forest. It is, however, still quite numerous on some of the larger Hampshire ponds, and on the East Dorset coast. *Oxygastra curtisii* has not been found in its last remaining Hampshire locality since the recent housing estate was built, and its extinction in Britain must be regarded as a distinct possibility. The status of *Libellula fulva* is now reasonably satisfactory in the area, with at least three colonies within two miles of the Bournemouth boundaries.

ODONATA. ZYGOPTERA. Only a few *Coenagrion mercuriale* were seen in its principal Hampshire locality (the author saw none), and these were not so widely spread as usual. It is normally on the wing with *Ceriagrion tenellum* and *Ischnura pumilio.* The latter does not appear to have been seen in its local headquarters

during the season, but the numbers do fluctuate considerably from year to year, and poor emergences even for a few seasons together have no long-term effect on the colony generally. In June 1964 it was particularly abundant and spread considerably.

TRICHOPTERA. During the season work was begun on a check list of Trichoptera in a relatively small area of Christchurch. So far the following have been found: *Limnephilus flavicornis, Limnephilus rhombicus, Trianeodoes bicolor, Glyphotaelius pellucidus, Setodes argentipunctella, Anabolia nervosa, Leptocerus aterrimus, Goera pilosa, Agapetus fuscipes, Sericostoma personatum, Stenophylax stellatus.* No doubt future research will add greatly to this list.

To the entomologist the Bournemouth area is one of the finest in the country, and records of a number of insects are most urgently required. Some are known to be in the area at the present time: others have been recorded in the past. The Chairman will be grateful for any recent records of the following species:— **ORTHOPTERA:** *Gryllotalpa gryllotalpa*—occurs in the area; *Chorthippus vagans*—recorded from near Bournemouth; *Gryllus campestris*—old records only. **ODONATA:** *Sympetrum flaveolum* —recorded from the area in 1959 by the author; *Sympetrum sanguineum*—also recorded by the author in 1959. It is a more or less regular visitor. **COLEOPTERA:** *Oodes helopiodes*—very local and rare; *Colydium elongatum*—no records since 1955; *Ernobius mulsantianus*—recorded from Hampshire, Surrey and Berkshire; *Diaperis boleti*—no records since 1961; *Hetaerius ferrugineus*—very rare, found in the nests of *Formica sanguinia* (Formicidae). **HYMENOPTERA:** *Embolemus rudii*—one record only, extremely rare. **DIPTERA:** *Ocyptera interrupta*—confined to small areas in Hampshire and Dorset.

Although they are not Insecta, the Chairman would be grateful also for any recent records of the following species of **ARACHNIDA:** *Eresus cinabarinus*—recorded from Bournemouth at the turn of the century; *Argiope bruennichi*—recorded from the area.

The Entomological collection has been re-arranged to keep the Odonata separate from the original Linnean Order of Neuroptera. The foreign species in particular, and a few of the British, were arranged and labelled collectively. The Linnean Neuroptera embraced Trichoptera, Mecoptera, Odonata, Ephemeroptera, Plecoptera, etc. The arrangement has now been changed to the modern sub-division, retaining Sub-orders Plannipennia and Megaloptera as the only divisions of Neuroptera, the former comprising Families Osmylidae and Chrysopidae, and the latter Sialidae and Raphidiidae.

The Chairman delivered two entomological lectures during the season. In October, with "Dragonflies of Southern Hampshire", 35mm. colour transparencies taken by Mr. W. L. Chick were used to illustrate most of the species that are likely to be seen in this area. In March, "A Selection of Local Insecta", was illustrated with many colour transparencies kindly loaned by Mr. S. C.

Bisserôt, A.R.P.S. The Chairman also delivered a lecture in January on the subject of "British Reptiles and their need for Conservation".

A number of insects were identified for members during the year. In April Mr. W. R. Pring of Wimborne very kindly presented to the Society nine cases of African Lepidoptera, some of which were displayed for National Nature Week by Mrs. N. Sephton. The Society and the Section are most grateful to Mr. Pring, and also to Mrs. Rossiter for her assistance. In June the Section had a request from University College, London for *Lampyris noctiluca* (Coleoptera. Malacodermata.)

The Chairman deeply regrets the death on Saturday, May 21st, of Mr. W. S. I. Cox, F.R.E.S. Mr. Cox was Chairman of the Entomology Section for many years, and his work will be remembered with gratitude.

Finally I would like to record my grateful thanks both to Council and members for my warm welcome to the Society and to the Chairmanship of the Entomology Section.

K. G. GOODYEAR

Zoology

ORNITHOLOGY

During the year 22 Programme Field Meetings were held. One was abandoned at the end of the most interesting part of the route; otherwise the weather was favourable. Noticeably fewer birds were seen in one or two formerly unfrequented and quiet areas. As the vegetation remains unchanged this is probably due to the ever-increasing spread of more people farther afield.

The dates of the Meetings given on the bi-monthly Programme are dependent on both the Lecture dates of other Sections, and on the tides. As this makes it impossible to consider the convenience of members, it is therefore remarkable how little the composition of the Group varies—apart from new members. The interest is recognized and appreciated.

Rarities have not been a feature of this year, but there has been no lack of interesting waders, duck and migrants. Among other occasional appearances were Little Stint, Knot, Grey Plover, Whimbrel, Turnstone, Sandpiper, Kingfishers, and a feeding flock of 38 Redwing (Stanpit, January 18th). Finally, a Mallard mother with 9 very young fluffy ducklings swimming down the ditch at Waterditch!

Dartford Warblers and Stonechats, decimated by the severe winter of 1962-63, are recovering, but only slowly. The new Reserve at Arne will help locally. In the New Forest, Crossbills were often seen busy at cones and berries by September.

In last year's Report the absence of the Durlston Head Puffins was noted. I learnt later that they were present along the coast farther west. This year they were at the usual place together with the other sea birds. In addition to gatherings of Swallows and some Spotted Flycatchers whose migration appeared imminent,

Ballard Down was notable for more Wheatear of both sexes, and also Butterflies such as Painted Lady, Clouded Yellow, and the smaller Blues.

The unprecedented scale of the Waxwing invasion from Scandinavia must be recorded. It commenced in October, 1965, spread rapidly down the eastern half of Britain, and reached the Low Countries. The numbers were so great that berried trees and shrubs were stripped during the autumn, and then winter forced the birds to take such food as ornamental crabs, any sort of berry remaining, and even fruit rotting on the ground. Many local people, including a number of our own members, were given the unusual opportunity of seeing this interesting bird in their own gardens.

A most informative and well illustrated lecture on "Deer of The New Forest" was given by Miss K. M. Bennetts on March 21st. Later a successful meeting was held in The Forest under her guidance.

On October 9th papers were given by three young scientists. Two of these have been reported elsewhere. In the third Mr. C. Irwin told us of a week spent by him and a companion using a cylinder from which to study under-water biology in Plymouth Sound.

On August 24th Mr. R. Warne gave members a detailed and illustrated lecture on "The Structure of Animal Cells". This dealt not only with current factual knowledge and the steps leading to it, but indicated possible lines of future research.

On November 10th the Chairman gave another talk on the ornithological specimens in the Museum, over 100 in number, and again stressed the debt owed to the many donors. He then explained in some detail the operations requiring great skill and care which were essential before a dead bird became a magnificently mounted lifelike specimen. Arrangement according to Genus was explained and illustrated.

H. V. HARRIS

Cine Film Subscription Programmes

The late Mr. A. J. Aiers organized the first three meetings, and the writer completed the programmes. The meetings have been well attended; the numbers, though not so high as they were a few years ago, have increased steadily over the season. Altogether twenty-one films, all in colour, were shown at the seven meetings. By showing fewer longer films, it was possible to include some previously regarded as too long, as well as obtaining a better balance between the various sections of the Society's interests. As far as possible all branches of the Society's activities were covered in a manner supplementary to the more formal lecture.

Many welcome suggestions for films have been received. Some of these have been included in the 1966-67 programmes and others are listed for possible showing in later seasons. Our thanks are due to the Cine Projection Panel—Mr. D. J. Dudley and Mrs. I. Sewell, and to Mr. W. H. James and others for helping in the Hall and elsewhere.

J. C. MITTON

Presidential Address

The Mountains of East Africa and their Vegetation

by MRS. A. K. HUNT, B.Sc.

Delivered before the Society on the 8th October, 1966

As some of you know, I lived for many years in East Africa, during which time I was able to climb several of the mountains, and it is my privilege and pleasure to address you today on a subject which I have found extremely interesting—hence my title.

PART I

Africa, one learns, is a Plateau, and the first sight of it from Table Bay certainly confirms this statement as one beholds Table Mountain in the background, but when the train has laboriously climbed to the top of the "table", one sees, surprisingly, that in the distance is another apparent range of mountains up which the train eventually climbs, and so on. The same is true of a journey to the interior of East Africa, where the land rises by a series of steps, each between 1,000 and 2,000 feet high, until altitudes of 5,000 feet and upwards are reached.

The traveller by train from Mombasa (on the coast of Kenya) to Nairobi, waking in the brilliant sunshine of the early morning as the train trundles along on the last stage of the journey, may be fortunate enough to see a view, unique in the scenery of the world! About one hundred miles to the south a great snow-capped dome appears to float in the haze, while to the north, again about one hundred miles away, is a jagged peak, also snow-capped. These are two of the remarkable mountains of East Africa: Kilimanjaro, 19,000 feet, situated just inside the borders of Tanganyika (now Tanzania), and Mount Kenya, 17,000 feet, which lies right on the Equator. I refer to them as "remarkable", since in other parts of the world such peaks would form part of a mountain range, whereas here they rise as isolated "Massifs" from the plains around them and have been designated "Island Mountains".

Both Kilimanjaro and Mount Kenya lie on the east of the Great Rift Valley, which runs in a north to south direction through this part of Africa. On the west of the Rift, and forming part of the boundary between Kenya and Uganda, is another great mass, Mount Elgon, 14,000 feet, while still farther west are the Ruwenzori Range (Mountains of the Moon) and the Virungu Mountains of the Congo.

All these mountains are of volcanic origin and show varying degrees of activity. Mount Kenya is completely extinct and greatly eroded, the present twin peaks being the original core of the volcano which must have been much higher when the cone was present. Kilimanjaro has a well-formed crater in the centre of its main peak, which still shows a certain amount of volcanic activity.

Mount Elgon and the Ruwenzoris are extinct, but the Virungu Mountains are extremely active, providing a wonderful display on some nights.

SOIL.—Consequent upon their volcanic origin, the slopes of these mountains are formed from hardened lava which has weathered into powder and been enriched by the accumulated humus of many generations of decaying organic matter, to give a highly fertile soil in places sheltered from the drying winds.

CLIMATE.—Although all these mountains are situated within four degrees of the Equator, at no time can their climate be called tropical, since even at the foot the altitude is not less than 3,000 feet, giving a sub-tropical zone which extends to about 6,000 feet. Above this level the climate becomes in turn temperate, sub-arctic, and finally alpine-arctic on the summits of Kilimanjaro, Mount Kenya and the Ruwenzori which have eternal snow and glaciers. The snow-line at these latitudes is about 16,000 feet, so Mount Elgon, the Virungu Mountains and others which do not reach this height, although frequently covered after a blizzard, have no perpetual snow.

Being so near the Equator, these mountains have no summer and winter, but only wet and dry seasons. During the wet season, the high alpine regions are deeply covered by soft snow, impossible to negotiate, so ascents are made in the dry seasons. Conditions at altitudes above 12,000 feet are extremely severe; days of thick, icy mist alternate with clear days when sun temperature reaches tropical heights. Night temperatures are always well below freezing and most of the time there are gale-force winds desiccating the soil and plants.

VEGETATION.—Following this brief description of the climatic conditions prevailing here, I next propose to give you some account of the main types of vegetation found on these mountains, confining my observations to Kilimanjaro, Mount Kenya and Mount Elgon since they are the ones of which I have had personal experience.

The most striking thing about the vegetation of all these high mountains is the very marked zonation. The forest belt terminates quite abruptly at approximately 9,000 feet, followed in most cases by about 1,000 feet of bamboo forest, which then ends and the high moorland appears. The snow-line in these latitudes is about 16,000 feet, and above this there is little or no plant life.

In addition to the very high mountains there are many lesser ones whose vegetation follows the same pattern but ends with the zone consistent with the altitude, e.g., mountains of 10,000 feet have bamboo up to their summits. If they reach 12,000 feet there will be about 1,000 feet of the moorland country. Mount Elgon, a little over 14,000 feet, has about 3,000 feet of moorland at its summit but no permanent snow.

FOREST.—Now I should like to spend a little time considering some details of the vegetation of these different zones, beginning with the forest which appears at between 4,000 and 5,000 feet. This consists of a canopy of very tall trees, a tangled mass of climbing plants, or lianes, and the ground flora. The trees are mainly of the broad-leaved type and are evergreen. Species of figs, olives and ebony are common, but owing to their height the leaves and flowers are usually out of sight so that identification is difficult. They cast a deep shadow which influences the types of plants that can survive below them. The lianes are climbing plants of a perennial character. When young they climb rapidly upwards by producing slender green stems with very small leaves; slight inequalities in the bark of the trees provide supports for these stems which, in many cases, are furnished with prickles. After a short time, these climbing stems develop secondary thickening, often of an unusual kind. Instead of one central cylinder surrounded by rings of wood, several centres are formed, and each produces its own rings (anomalous secondary thickening). This gives the effect of a thick rope which possesses both strength and elasticity to withstand the strain of supporting the plant and resisting strong winds which frequently drive through the forest. The prickles on such stems also develop secondary thickening, thus increasing in size and strength as the liane grows older, until the whole stem becomes an extremely formidable obstacle if one tries to penetrate into the forest.

Many herbaceous plants obtain the light they require by becoming epiphytes on the branches of the trees; they are completely independent in their methods of obtaining food, i.e. autotrophic, living on soil which accumulates in crevices in the bark of the tree, and carrying on photosynthesis. Almost any plants present in the undergrowth may occasionally be found growing as epiphytes, but of outstanding interest are the epiphytic orchids, of which members of the genus *Bulbophyllum* are examples. They have a main stem which creeps along the branch of the tree, and produces scale leaves and two types of roots: those attaching it securely to the branch and aerial roots. Each scale leaf subtends a short lateral branch which swells to form a pseudo-bulb and stores water; at its tip thick fleshy leaves are formed one at a time so that never more than two are present at once. The aerial roots hang down from the branch and consist of a central green tissue which is able to assimilate carbon dioxide, and a thick surrounding layer of velamen. This velamen is a spongy tissue which absorbs moisture from the air and also provides a home for nitrogen-fixing bacteria which supply the essential nitrogen compounds to the orchid.

The ground flora consists of shade-loving plants, including species of *Begonia, Impatiens* and many of our 'Greenhouse Plants' such as *Streptocarpus* and *Saintpaulia,* while along the many river beds tree-ferns are abundant, their crowns of enormous fronds imparting a feathery touch to the scene.

As the upper limits of the forest are approached, at 8,000-9,000 feet, open glades appear which are frequently very beautiful. On Kilimanjaro, one such glade was resplendent with *Kniphofia* (Red-hot pokers) in full bloom, interspersed with the graceful inflorescences of a species of *Dierama* (Wand-flower), both plants familiar in our gardens. In the forests of Mount Kenya, a most striking sight was a long glade of *Delphinium macrocentron* which grows to about three feet and has large blue flowers tinged with green. This species was also present on Mount Elgon, though more sparsely distributed.

An interesting feature of the vegetation of these high-altitude grasslands is the number of species present which closely resemble our English wild flowers and are common to the alpine zones of each of the mountains. After the climb through the forests where most plants were strangers, it was a great surprise to find so many representatives of the British flora such as species of *Thalictrum, Scabiosa, Anagallis, Alchemilla, Sanicula* and other members of the Umbelliferae Family, to mention but a few.

The Gentianaceae was represented by members of the genus *Swertia,* which is not found in Europe, but in China and the Himalayas. These plants are low-growing, with cup-shaped flowers whose corollas are purplish-brown instead of blue; the species are different on all the three mountains. Another plant of phyto-geographical interest is *Canarina* which is otherwise only found in the Canaries and Abyssinia.

BAMBOO FOREST.—At an altitude of about 9,000 feet the evergreen forest zone ends quite abruptly, to be replaced on Mounts Kenya and Elgon by dense bamboo forest and on Kilimanjaro by the giant heath *Erica arborea.* The bamboo forest is most eerie; the stems of this giant grass are up to 30 feet high and many have a diameter of about four inches at the base. They grow close together and cast so deep a shade that there is practically no under-growth except along the sides of the elephant tracks which we used as paths. All the time there is a whispering noise, broken at intervals by what seems to be a loud shriek, but is really the noise made as the stems, swaying in the wind, rub against one another. The bamboo forest extends for about 1,000 feet and then ends as suddenly as it began, and one emerges on to the wind-swept grass lands of the sub-arctic zone.

On Kilimanjaro there is no bamboo; instead one passes through a forest of giant heath which grows to about 15 feet, and this in turn gives way to moorland vegetation.

MOORLAND.—Heath, as we know by local observations, is admirably adapted to withstand lack of moisture, drying winds, cold and other adverse conditions; in other words, it is a typical xerophyte. Its leaves are much reduced and usually rolled so that an atmosphere of moist air is enclosed over the stomata which are present only on the inner surface of this enclosure. It is interesting to find how many plants of quite unrelated families have

adopted similar methods of growth in order to survive the rigours of climate at this altitude. What appeared to be white heather on Kilimanjaro proved to be a species of *Hebenstretia* belonging to the Scrophulariaceae (a genus found only in Africa), which produces wiry stems thickly covered with greatly reduced leaves and small white flowers. Other ericoid plants produced heads of yellow florets and were obviously Composites.

At these altitudes another genus of the Compositae Family, namely *Helichrysum,* is widely represented both in number of species and in the quantity of some individual species. These everlasting flowers are present on all the mountains, but they appeared to be larger and more plentiful on Elgon than on the other two. The plants vary in height from about two feet at the lower levels to only a few inches at higher altitudes, and they were among the few plants surviving at what appears to be the limit of plant life on these mountains, viz., 16,000 feet. The stems are thickly covered with silky white hairs which may serve to insulate them against the deleterious effects of intense cold at night alternating with high temperatures by day and a constant drying wind when the sky is clear. The head is surrounded by layers of stiff shining bracts which do not wither and therefore render the flowers "everlasting". Their colour is either pure shining white, white tinted with the most delicate rose, or gold, and to see acres of these in the sunlight is an incredibly beautiful sight. A recent publication on this subject suggests that both the silvery white leaves and shining bracts reflect much of the intense ultra-violet radiation prevalent at these altitudes, thus preventing the surfaces of the stems and leaves from being overheated during the day.

Giant Senecios and Lobelias.—As we continue to climb beyond 10,000 feet, we begin to see those remarkable plants for which these mountains are famous, viz., the giant groundsels and lobelias which occur only on the mountains of East and Central Africa. Although these plants are often referred to as "trees" they are very unlike the usual trees of the dicotyledonous section of flowering plants to which they belong, their growth being much more like that of palms or tree-ferns.

The giant groundsels occur on all mountains of tropical Africa which attain an altitude of 11,000 feet; they appear to be tallest at between 12 and 14,000 feet when they may attain a height of almost 20 feet. The main stem or trunk produces a dense rosette of leaves at the top; these are constantly developing at the centre while the old ones under the rosette dry up and droop downwards, clothing the stem in a thick covering which gives a most characteristic appearance to the plants. The main stem continues to grow taller year by year, until finally the terminal inflorescence is produced as in our common groundsel or ragwort, but, unlike these plants, this is not the end of the lives of the giant forms. Buds develop in the axils of two or three of the upper leaves and grow into new branches which are of equal lengths (Dichasial branching), each of which will in time form an inflorescence at its tip and

branch again. Once branching has taken place, the old leaves begin to peel off the stem, leaving it protected only by its own bark. Although the trunk increases in girth by secondary thickening, no trace of annual rings has been found, probably because of the lack of periodicity in the growth since there is no alternation of resting and growing seasons.

The leaves are very large, as much as 2 feet long and 9 inches broad in some cases, tough and thickly covered with woolly hairs, especially on the under surface. They also contain mucilage and oil-ducts, which may help to prevent them from drying up too quickly.

The flowers are borne in branched inflorescences and closely resemble those of our local ragworts, having both the disc and ray florets which are said to be completely normal in structure in all species. Pollination is doubtless carried on by the ubiquitous fly or by large weevils which live among the leaves.

It has been estimated that these groundsels may live for as much as 100 years.

The species vary on the different mountains, for instance on Mt. Kenya at 10,000-11,000 feet, *S. brassica* is a dominant feature of the vegetation. (This is not actually a tree form, but low-growing and as its name suggests, resembles a large cabbage with its leaves pointing upwards so that the silvery undersurface is exposed to view.) *S. keniodendron* is another species found on Mt. Kenya, while *S. kilimanjaro* and *S. elgonensis* are specific to the mountains after which they have been named.

Everyone is familiar with the small herbaceous plants belonging to the genus *Lobelia* which are so popular in formal bedding. It is a genus which is widely distributed, especially throughout the temperate regions, but in various parts of the world species are found which have a woody stem and so are classed as shrubs. On the East African mountains there are several species which are frequently referred to as trees because of their size and the woody texture of the stems, but, strictly speaking, they are not trees at all, and are better referred to simply as Giant Lobelias.

In their early stages they resemble the *Senecios* in appearance as they also form a rosette of very large leaves, protected by a thick cuticle instead of a tomentum of hairs as in *Senecio*. Growth continues by the development of new leaves at the centre for a period which has been estimated as 15-20 years, by which time the plant may be 5 or 6 feet high. It then produces its inflorescence from the terminal bud; this is a dense spike of flowers about a yard long. Each flower is formed in the axil of a bract which may be short and stiff, or, in one of the common species on Mount Kenya, *L. telekii*, very long and covered with silky hairs giving the inflorescence the appearance of a silver fox fur.

The flowers themselves are deep violet in colour and shaped like those of *L. cardinalis* (the crimson form often seen in gardens).

They are pollinated by a species of Sunbird (Family: Nectariniidae) which is a small bird with a long curved beak, strong and finely pointed, and a hollow tongue which can be protruded for a considerable distance. The birds hover round the inflorescences inserting their beaks under the protective bracts and taking the nectar from the flowers through their long tongues and at the same time no doubt carrying away the pollen which is then transferred to the next flower. The fruits then develop, and when ripe contain hundreds of small seeds which are dispersed by a censer arrangement as the inflorescence sways about in the strong wind. After flowering the whole plant dies and falls over.

The Lobelias are also largely specific to the various mountains, particularly at high altitudes, though in the forests there are species which are common to all.

At about 15,000 feet the vegetation becomes more and more sparse, and the giants give way to very low-growing plants frequently prone on the surface of the ground. The stems and leaves of these are extremely tough and wiry, and possess a remarkable power of surviving intense cold and drying winds when they appear to be quite dead, recovering and turning green again immediately a sunny morning follows a night of misty rain; they are, in fact, "Resurrection plants". Some of these were ferns, but we also found very small plants of *Helichrysum* and *Alchemilla*. One species of Composite formed a rosette of leaves with a hollow in the centre where the inflorescence was produced about an inch below ground level!

Finally the vegetation peters out and above 16,000 feet there is nothing but volcanic ash.

PART II

In the first part of this address I have tried to give you a picture of the types of vegetation on the mountains of East Africa, and I think you will have observed several curious facts which are worthy of consideration, one of the most striking being the presence on each mountain mass of the giant *Senecios* and *Lobelias* whenever a sufficient altitude is reached. Their occurrence is even more remarkable when one considers that these mountains are separated by hundreds of miles of sub-tropical country so that seed dispersal alone seems an unlikely explanation of their distribution. Before the advent of Charles Darwin it would have been said that these strange plants had been "specially created" on each mountain, a very simple way out of the difficulty. But when Darwin's theory of the Origin of the Species had once been accepted the simple explanation was no longer tenable. What other possibilities are there?

According to Darwin's theory all members of a species must have originated from one common ancestor, in the far-off past,

and spread by the dispersal of seed. In the course of time, mutations and hybridization gave rise to new variations which became established as new species if they were suited to their environment. These new species would increase in numbers as long as external conditions were suitable, but as soon as inevitable climatic changes occurred their spread would be checked and, in time, they would begin to decrease and die out, while other new variations took their place. As Professor Good points out in his book, "The Geography of the Flowering Plants", a species passes through a cycle similar to the life of an individual: a vigorous youth, a period of maximum vitality and then a gradual waning when the number surviving decreases until a time comes when only a few of the original species remain, in places where conditions are particularly suitable. This he calls the Theory of Generic Cycles and it may well be applicable to the problem in hand.

Fossil records have shown that in Carboniferous times there were many tree-like forms of such plants as club-mosses, horsetails, etc., which, today, we know only as herbaceous types. Possibly, in the remote past, before the volcanic eruptions which produced these great mountains, all species of the genera *Senecio* and *Lobelia* were tree-like forms, and gradually their descendants adapted themselves to external conditions by becoming first shrubby and then herbaceous. The giant forms would then represent what might be termed the "old men" of the species, surviving only in the high altitudes of the mountains of this particular area. As each mountain mass is widely separated from the others, it is quite understandable that, in course of time, variations in the species on each particular mountain would again take place. In this connection it is interesting to note that there are shrubby species of both genera in the forest zone, and in its lower parts normal herbaceous species are common to all the mountains.

Erica arborea, which replaces the bamboo on Kilimanjaro, is another giant form of a genus whose species are generally small shrubs. This genus is widely distributed in Africa, and Professor Chevalier considers that the tree-like form is a relic of the Tertiary flora of the region, from which other members are descended. Thus the many forms of Erica present in Africa may represent the virile offspring of an ancient ancestor still surviving on the mountains as *Erica arborea.*

Finally we have the strange appearance on all these mountains of a large number of genera whose species are the same as, or closely related to, species common in temperate climates, including the British Isles. As I mentioned in the first part of my address, these species are, here, confined to altitudes of 9-10,000 feet. Engler has suggested that their presence could be accounted for by the distribution of their seeds, but this seems unlikely since most of the species produce seeds which are not wind dispersed, and migratory birds which might carry the seeds on their feet are now considered to follow a course nearer the sea.

Darwin, in the "Origin of Species", explains similarities between the floras of widely separated mountains of Europe by taking account of the climatic conditions of the past. We know that during Pleistocene ages the northern ice-cap extended far south in at least three periods, forcing the vegetation south at the same time, since only those species would survive whose seeds had spread southwards and established themselves in suitable situations. Geological records indicate that the glaciers on the African mountains at that time extended much lower down than they do now, giving a moist, temperate climate to a large area in the vicinity. This would provide suitable conditions for plants which, driven south by the increasing ice in the north, gradually migrated via the mountain ranges of Northern Africa to Central Africa. Then, as the ice retreated again, conditions forced these plants higher up the individual mountains until they became established at the altitudes where they are living at the present time, while those remaining at intervening lower levels were exterminated. This may be a possible explanation of the number of European species found on these mountains at approximately the same altitudes despite the great distances between them.

The more one considers the distribution of plants on these mountains the more problems it presents. Why the absence of bamboo on Kilimanjaro? Why the presence of the species of *Swertia* when they rightly belong to Asia? And so on. Then again there are the peculiar growth-forms and life-cycles of the endemic species: what is their relation to the effects of life at high altitudes? Answers to these and other similar questions will no doubt be found as further knowledge comes to light; in fact since preparing this paper it has been brought to my notice that the report of work by a Swedish botanist on the ecology of Afroalpine plants has recently been published and provides some of the answers.

In conclusion may I express the hope that I have been able to convey to you, in some small degree, the deep satisfaction to be found in studying, not only the taxonomy of plants, but also their developments and adaptations to the conditions of life in this vast region abounding in botanical interest.

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The address was illustrated by a map and photographs.

Bournemouth Natural Science Society

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1916—17	The Rt. Hon. the Earl of Malmesbury, D.L., J.P.
1917—18	Sir Jethro J. H. Teale, M.A., D.Sc., LL.D., F.R.S.
1918—20	Field-Marshall Lord Grenfell of Kilvey, G.C.B., G.C.M.G., LL.D., F.S.A.
1920—21	Lt.-Col. Sir David Prain, C.M.G., C.I.E., F.R.S.
1921—23	F. G. Penrose, M.D., F.R.C.P., F.Z.S., M.B.O.U.
1923—24	Sir F. W. Keeble, K.B.E., D.Sc., F.R.S.
1924—26	Hubert Painter, B.Sc., F.C.S.
1926—28	Heywood Sumner, F.S.A.
1928—29	Claude Lyon
1929—30	Professor F. O. Bower, D.Sc., F.R.S.
1930—31	Henry Bury, M.A., F.L.S., F.G.S.
1931—32	Dukinfield H. Scott, M.A., LL.D., F.R.S., F.L.S., F.G.S.
1932—33	J. P. Williams-Freeman, M.D.
1933—34	Rev. F. C. R. Jourdain, M.A., F.Z.S., M.B.O.U.
1934—35	Sir F. W. Dyson, K.B.E., M.A., D.Sc., LL.D., F.R.S., F.R.A.S.
1935—36	Henry Bury, M.A., F.L.S., F.G.S.
1936—37	Sir Harold Carpenter, M.A., D.Sc., F.R.S.
1937—38	Professor John Cameron, M.D., D.Sc., F.R.S.E.
1938—39	Professor G. D. Hale Carpenter, M.B.E., D.M., F.L.S., F.Z.S., F.R.E.S.
1939—40	W. G. Aitchison Robertson, M.D., D.Sc., F.R.C.P., F.R.S.E.
1940—41	Rev. Professor M. C. Potter, M.A., D.Sc., F.L.S.
1941—42	Inst.-Capt. M. A. Ainslie, R.N., M.A., F.R.A.S.
1942—43	William C. Simmons, B.Sc., A.R.C.S., F.G.S.
1943—44	Professor S. Mangham, M.A.
1944—45	A. S. Hemmy, B.A., M.Sc.
1945—46	J. F. N. Green, B.A., F.G.S.
1946—47	Lt.-Col. G. C. Drew, D.S.O., F.S.A.
1947—48	W. J. Woodhouse, A.C.P.
1948—49	Edward Hindle, M.A., D.Sc., F.R.S., F.Z.S.
1949—50	Mrs. W. Boyd Watt, F.Z.S., M.B.O.U.
1950—51	Professor Sir R. A. Peters, M.C., M.A., M.D., F.R.S.
1951—52	Ernest Chambers, F.L.S.
1952—53	F. Williamson, F.R.Hist.S.
1953—54	H. E. Clarke, M.A., B.Sc., F.R.I.C.
1954—55	W. J. Read, M.Sc., F.R.I.C.
1955—56	W. S. Brown, B.Sc.
1956—57	A. W. Legat, M.Inst.C.E., M.I.S.E.
1957—58	D. A. Wray, M.Sc., Ph.D., F.G.S.
1958—59	Miss M. A. M. Penrose, B.Sc.
1959—60	Miss D. M. Lowther, B.Sc.
1960—61	James Fisher, M.A., F.L.S., F.Z.S.
1961—62	W. P. Winter, B.Sc.
1962—63	F. H. Perring, M.A., Ph.D.
1963—64	Miss F. M. Exton, B.A.
1964—65	Dame Kathleen Lonsdale, D.B.E., D.Sc., F.R.S.
1965—66	A. J. Butcher, F.R.I.B.A.
1966—67	Mrs. A. K. Hunt, B.Sc.

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